South African Medical Journal
Suid-Afrikaanse Tydskrif vir Geneeskunde
P.O. Box 643, Cape Town — Posbus 643, Kaapstad

Cape Town, 7 June 1958 — Vol. 32 No. 23 — Kaapstad, 7 Junie 1958
Weekly 2s. 6d. — Deel 32 No. 23 — Weekliks 2s. 6d.

KAPOSI'S SARCOMA OCCURRING IN A COLOURED MALE

C. J. UYS, M.D., D.CLIN.PATH. (RAND) and M. B. BENNETT, M.R.C.S., L.R.C.P., D.M.R. (LOND.)
Departments of Pathology and Radio-therapy of the University of Cape Town and Groote Schuur Hospital

This case of Kaposi's sarcoma is reported because of certain unusual and unique features. It is of interest because (1) it constitutes the first recorded case of Kaposi's sarcoma in a Cape Coloured subject, (2) there is evidence of visceral spread, and (3) autopsy findings are available—to our knowledge the second reported autopsy of this condition in South Africa. The patient's response to penicillin therapy and the unusually short course of the disease are also features of interest.

CASE HISTORY

K.R., a Coloured male farm labourer aged 40, first noticed multiple recurrent sores on the legs, thighs and buttocks in April 1956. These lesions discharged a bloody purulent fluid and healed without scars. In May 1956 swellings commenced in both groins and concurrently a low backache was experienced. In a country hospital, where the case was diagnosed as lymphogranuloma inguinale, he received antibiotic therapy without any change in the enlarged groin glands. Two months later he was admitted to Groote Schuur Hospital, his presenting symptoms still being swellings in the groin glands and low backache. He was in good condition on examination and showed enlarged lymph nodes in the groins, axillae, and epitrochlear and cervical regions, the largest being in the groins. These were tender, discrete, mobile, rubbery-firm in consistency, and not attached to the skin or deeper structures. The liver and spleen were both enlarged. No skin lesions were noted and the only other positive finding was a small rectal polyp.

Special Investigations: Haemoglobin 11 g.%; total white-cell count 4,700 per c.mm.; sedimentation rate 74 mm. in 1st hour (Westegren); blood Wassermann positive; the bone marrow showed no significant change; and X-rays of the chest and spine were normal.

Biopsies were performed on the groin and neck glands and on the rectal polyp. The diagnosis of Kaposi's sarcoma was made on the histological appearances of the glands; and the rectal nodule showed the features of a benign adenomatous polyp. In view of the positive serological tests for syphilis, the patient was given ½ million units of penicillin b.d. for 2 weeks; no change in the size of the glands was noted. On 30 July one small raised plaque was noticed on the lower medial aspect of the right leg. On 9 August and on 3 consecutive days 5 mg. of nitrogen mustard was given intravenously without any significant change being noted in the size of the lymph nodes. On 16 August large purple patches appeared on the right thigh, small purple grape-like masses appeared on the gums, and the groin biopsy scar became dusky purple in colour. During the last 2 weeks of August many ecchymotic patches developed on the chest, lower abdomen and legs, the glands increased in size, the swellings on the gums increased in size up to 1 cm., and flat purple patches appeared on the conjunctival surface of the eyelids. During this period the patient's general condition deteriorated rapidly. It was found that he had lost 20 lb. in weight since admission in mid-July, his haemoglobin had fallen to 8 g.% and his leucocyte count to 2,600 per c.mm. He became dyspnoeic and was confined to bed because of the associated backache and cramping abdominal pain. No abdominal masses could be felt and no definite cause of his abdominal pain was found, though it was thought he was developing multiple visceral lesions. Radiographs of his chest showed bilateral pleural effusions, more marked on the left than the right. No abnormality was seen in radiographs of the spine.

On 31 August he was started on 4 million units of penicillin daily, which was continued for 21 days. During the first week the disease progressed and oedema of the lower abdominal wall and scrotum and thighs became marked. During the second week of the penicillin treatment the patient began to improve. His pain was much less and it was possible to discontinue his analgesics, and during the third week his breathing improved and radiographs showed progressive diminution of the pleural effusions. The oedema and ecchymotic patches subsided, the nodules on his gums decreased in size, and the patches in the conjunctivae disappeared. The patient's appetite and energy improved and his haemoglobin level was maintained at 10 g.%. In contrast to this, a further biopsy of one of the small neck

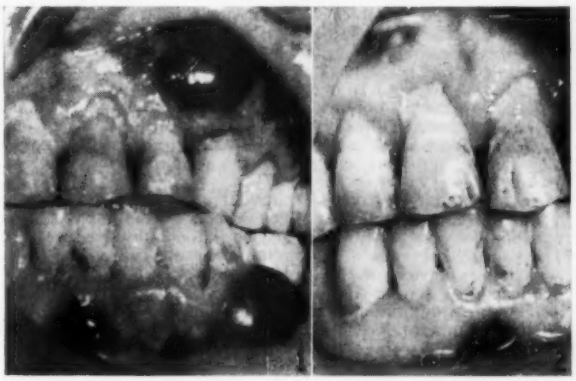
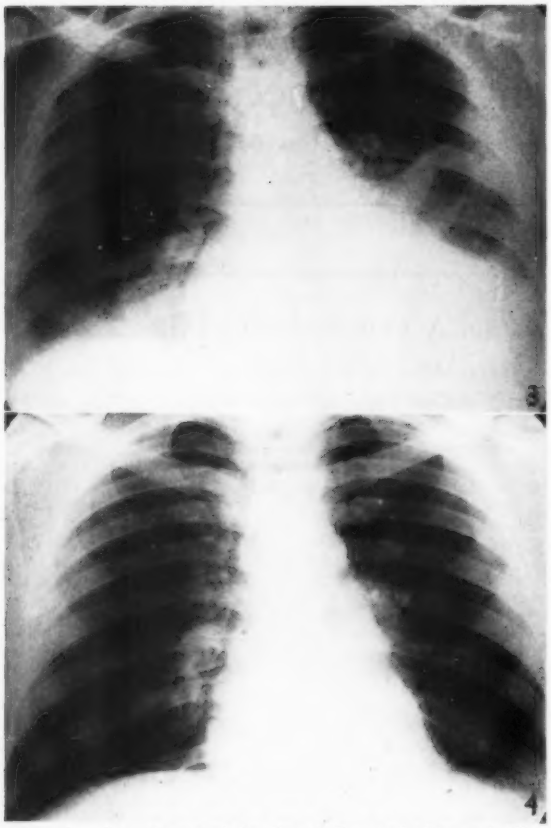


Fig. 1. Berry-like, haemorrhagic tumour deposits as they appeared on 27 August 1956, before the institution of massive penicillin therapy.
Fig. 2. The appearances of the gums on 3 October 1956, after the patient had received penicillin. At this stage the nodules had retrogressed in size considerably and were barely visible.



Figs. 3 *and* 4. X-rays of the chest before and after penicillin therapy, illustrating the disappearance of pleural effusions that occurred.

nodes which macroscopically appeared normal still showed the histological features of Kaposi's sarcoma.

He was discharged on 1 October 1956 on twice-weekly maintenance doses of penicillin, but was readmitted on 15 November 1956, having returned from his home in the country, where he had been unable to obtain the maintenance doses of penicillin. He had remained well for about 3 weeks after his discharge from hospital and then the low backache had returned and become more severe, and there had also been some loss of appetite and loss of weight.

He was found to have generalized lymphadenopathy, an enlarged liver and spleen, and slight oedema of the ankles. The gum nodules were barely visible and no skin nodules were present. The haemoglobin was 8·5 g.% and the white-cell count 7,600 per c.mm. In view of the evident recrudescence, the penicillin treatment was started again at 2 million units daily and later increased to 4 million units daily, and 2 pints of blood were given on 19 November, both without effect.

During the next 2 weeks gross oedema of the whole abdominal wall, thighs and scrotum and penis became a marked feature. It was no longer possible to assess enlargement of the spleen and liver or to identify other abdominal masses owing to the oedema of the abdominal wall. Radiographs of the chest showed increasing bilateral pleural effusions, but radiographs of the spine showed no evidence of deposits. His condition steadily deteriorated and he died on 9 January 1957.

Post-mortem Findings

The autopsy was performed approximately 48 hours after death. The body was markedly emaciated. Pronounced pitting oedema of the legs, which extended from the feet to the sacrum, and involved the penis and scrotum as well, was present. All the serosal cavities contained serous effusions. The skin and the mucous membranes of the gums and conjunctiva contained multiple raised purple nodules, which varied in size from a few mm. in the eye to 2-3 cm. elsewhere; the skin nodules were most numerous over the thighs, especially the medial aspects.

The majority of the superficial lymph nodes, the tonsils, the lymphoid tissue at the base of the tongue, the paratracheal, tracheobronchial and bronchopulmonary lymph nodes, and the mesenteric, portal and retroperitoneal lymph nodes, were either totally or partly replaced by deeply haemorrhagic tissue of a firm fibrous consistency. The retroperitoneal, para-aortic and lumbar glands were most extensively involved, presenting as continuous sheets of haemorrhagic tissue. Similar focal aggregates occurred in the spleen and the lumbar vertebral and the femoral bone marrow. From the retroperitoneal lymph nodes tissue appeared to extend into the right adrenal and the peripelvic tissues of the left kidney.

The liver was enlarged and contained focal deposits of subcapsular and periportal haemorrhagic tissue, and occasional deposits of pale tissue resembling secondary deposits of tumour growth.

The mucosa of the entire gastro-intestinal tract showed varying degrees of involvement by similar haemorrhagic tissue, which

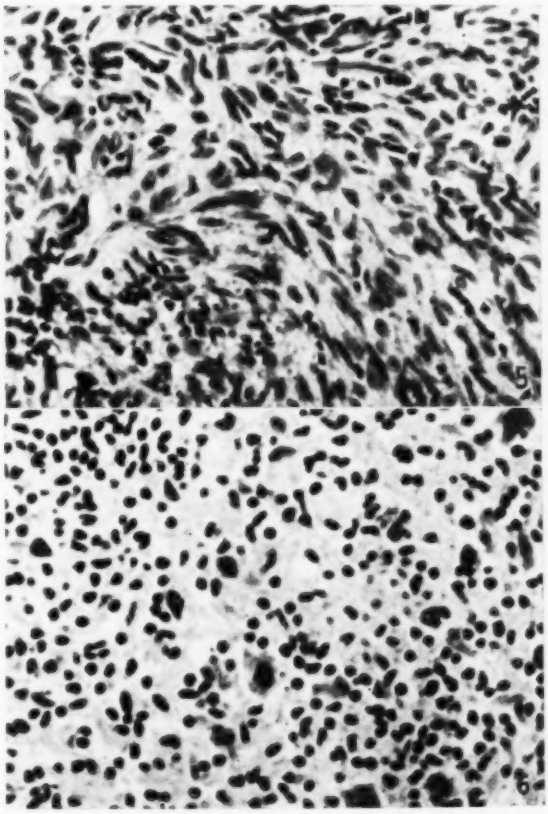


Fig. 5. The typical histological appearances seen in the majority of tumour deposits. Spindle-shaped cells arranged in a haphazard fashion predominate and, between these, lying free and occurring in capillary-type vessels, are numerous red cells. (H. & E. × 250.)

Fig. 6. The histological appearances of the deposits in the liver. The spindle-shaped cellular elements have been replaced by lymphocytic cells, reticulum cells and giant cells of the Hodgkin's type. This picture is distinctly similar to that seen in Hodgkin's disease. (H. & E. × 250.)

appeared to project from the submucosa and in only a few instances showed mucosal ulceration. In the oesophagus the nodules were discrete but in the stomach they occurred as multiple polypoidal masses, ulcerated in places, replacing the entire mucosa and seriously reducing the size of the lumen. From here there was a progressive reduction of the deposits, both in size and frequency, as one proceeded distally, with only isolated single massing occurring in ileum and colon.

Multiple nodules were noted in the diaphragm and two almost microscopic nodules in the posterior wall of the right auricle.

The brain, pancreas, the remainder of the myocardium, and both lungs, contained neither macroscopic nor microscopic tumour.

A varying histological picture was present. The pattern seen in the glands, skin and mucosal nodules was the typical tumour-like deposits of spindle cells with elongated deeply-staining nuclei and scanty eosinophilic cytoplasm. They tended to be arranged in whorls and fasciculi and merged imperceptibly with the surrounding tissues. On the whole, intercellular connective tissue was unimpressive, but in some glands there was some collagen and moderate amounts of reticulin. Even microscopically the tissue was strikingly haemorrhagic because of red cells lying free between the tumour cells and in numerous newly-formed capillary and sinusoidal blood vessels. In addition to the capillaries in the tumour nodules, there were dilated vascular spaces of sinusoidal character, particularly on the periphery. Past haemorrhage was indicated by focal deposits of haemosiderin.

In some of the glands the neoplastic tissue showed all gradations from angio-sarcomatous to a typical granulomatous response in which the cells were epithelioid in character and intercellular collagen was abundant. While a feature of most of the deposits was uniformity of cell type, the liver contained foci that histologically were indistinguishable from Hodgkin's disease and showed a pronounced degree of cellular pleomorphism.

DISCUSSION

The occurrence of Kaposi's sarcoma has been described in most races, but there are some in whom it appears to occur more frequently, though most data suggesting racial variation apply more properly to geographical distribution. It is common in Russia, Poland, Northern Italy and the countries bordering the Mediterranean and Caspian seas.[1] It has been stated that the majority of cases have been in Jews and Italians, and that it is rare amongst Anglo-Saxons[2] and Negroes.[1] Kaminer and Murray,[3] however, have stated that while it is a rare condition in the South African Bantu, it is not as uncommon as one would imagine from reading the literature; in fact they get the impression that it is more frequently encountered in the Bantu than in the European in South Africa. To date, in South Africa there has been only one case report of an autopsy and that in a Bantu subject.[4] Elsewhere on the African Continent it has been reported in the Natives of Nigeria,[5, 6] in an African from Uganda,[7] in the Wa-Kikuyu,[8] and in East Africa.[9]

To our knowledge this is the first case, confirmed by biopsy and post mortem, that has been described in a Coloured subject. In our routine histology records few cases have been diagnosed as Kaposi's sarcoma and these are more or less equally distributed between Europeans and Coloured. The comparative incidence is difficult to evaluate, for Coloured preponderate in our records and Bantu subjects are in the minority, but this finding may indicate that the disease occurs at least as frequently in the Coloured as in the European. However, it is doubtful whether this has any real significance, because the Cape Coloured do not constitute a true ethnic racial group but are a heterogenous mixture of Khoisan, Bantu, Malay and European races in ever-varying proportions.

In most of the cases of Kaposi's disease reported it is stressed that the disease is usually confined to the skin and mucous membranes and that visceral involvement is a rare occurrence. Visceral involvement is estimated by Tedeschi[10] to occur in only 10% of cases, by Choisser and Ramsay[11] in 14%, and by Duchen *et al.*[4] in South Africa in 10%. In our case, apart from the lesions in the skin and mucous membrane, the reticulo-endothelial system in such sites as lymph nodes, spleen, bone marrow, gut and liver bore the brunt of the involvement, and extra-reticular tissues were invaded only because of their anatomical proximity to obvious deposits of tumour growth, as in the kidney pelvis and the adrenal. This pattern of involvement closely resembles that seen in the Bantu case of Duchen *et al.*,[4] and for that matter the autopsied cases described in the rest of the literature.

Histologically, the bulk of the deposits in this case conform to other descriptions. In most of the deposits the predominating cell is elongated and spindle-shaped and produces varying amounts of reticulin and collagen. Cellular pleomorphism and signs of rapidity of growth are striking by their absence. The characteristic cells occur haphazard or in fasciculi and are closely related to an abundance of blood-filled capillary-type and sinusoidal blood vessels. Evidence of recent and old haemorrhage is present at most sites. The lymphomatous and granulomatous foci, although not undescribed hitherto, can be regarded as a pointer towards the histogenesis of these tumours. The range of histological appearances seen at different sites suggests a transformation of reticulum and endothelial cells to fibroblastic and epithelioid cells and an origin for the tumour in reticulo-endothelium.

The rapidity of this patient's decline is an unusual feature; the disease ran its entire course over a period of 9 months. Generally in fatal cases the course is over a period of 8-10 years, some patients living as long as 25-45 years, but a few have been recorded that have lived for only a period of months.[2] In this respect the progress of our case resembles that of a highly anaplastic tumour. However, as it has been stressed that anaplasia was virtually absent, we must attribute the patient's early demise rather to widespread involvement, possibly the result of multicentric origin.

A feature worthy of comment, but of doubtful significance, is the apparent response of this patient to massive penicillin therapy. On Garretts' suggestion[12, 13] that a trial of penicillin in massive doses was of value, this patient received a 3-week course and showed great improvement in the general condition, with radiological evidence of disappearance of pleural fluid and marked shrinkage of the visible lesions such as the gum nodules. Previous experience of these cases in this institution has suggested that the very slight improvement was due to lessening of the secondary infection of multiple fungating lesions.

Though the spontaneous remissions that are a feature of Kaposi's disease make it difficult to evaluate any therapy, the absence of sepsis in this case and the pronounced and maintained response to penicillin, suggests that the ameliorating effect was directly due to therapy. It would thus appear that penicillin therapy, while of equivocal value, at this stage at least justifies a trial.

SUMMARY

The clinical and autopsy findings of a case of Kaposi's sarcoma with visceral spread are recorded in a Cape Coloured subject; this constitutes the first recorded instance of the disease in this racial type.

Added and unusual features of this case are: (*a*) a rapid and fulminating course occurring over approximately 9 months and (*b*) short but dramatic improvement to penicillin therapy.

We wish to record our thanks to the Superintendent, Groote Schuur Hospital, for permission to publish this case; to Prof. J. G. Thomson for his advice and criticism and to Messrs. B. Todt and G. McManus for the photography.

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COMPENSATION FACTOR IN LOW BACK INJURIES*

EDWARD M. KRUSEN, M.D. and DOROTHY E. FORD, M.D., *Dallas, Texas*

The histories of 509 patients treated for low back injuries were studied for differences that might be related to compensation. Only 55·8% of the 272 patients receiving compensation were rated as improved at the time of discharge, as compared with 88·5% of the 237 patients not receiving compensation. Over two-thirds of the patients who did not receive compensation had appeared for treatment during the first month of symptoms, whereas only about one-half of the patients who received compensation had been seen at this point.

The mean number of treatments received by the compensation group, both men and women, greatly exceeded that for the non-compensation group. Some patients in the compensation group responded well to conservative treatment and returned to their jobs after a minimum number of treatments, but in others there appeared to be a difficulty within the basic personality structure. Psychiatric experience with the latter type has not been encouraging. Throughout the study, the women expecting compensation showed the worst response to treatment while receiving the greatest number of treatments. Prompt adequate diagnosis and early conservative treatment are recommended as essential in handling these patients, but there is real need for further investigation of the problem.

Results show that the longer a patient with a low back injury waits before treatment the smaller is the probability of his improving, regardless of whether he expects compensation or not, and that generally the patients who receive compensation are referred for treatment later than those who do not. The reasons for this are hard to explain. Admittedly, the more severely injured patients are eventually hospitalized for an intensive treatment programme, but one gets the impression that many of these patients receive inadequate therapy for a prolonged period of time. Even when an attempt is made to give physical therapy, this frequently consists of applying heat from a heat lamp or diathermy machine alone. This is certainly not adequate, but the patient considers it to be 'physical therapy' and, when he is finally referred for more intensive treatment, he has developed a prejudice against physical therapy which has to be overcome.

From this standpoint, it would often be preferable for these patients to receive no treatment rather than inadequate therapy, and certainly the latter should not be continued over prolonged periods of time. Otherwise, many patients become extremely resentful towards their employers, their doctors, or both, and lose their motivation to return to work. If a doctor is treating a patient without being able to provide an intensive treatment programme, there appears to be a danger point at about 1 month, after which results of treatment fall off sharply for patients in the compensation group.

Although results are worse for patients who are referred for treatment after 3 months or more, it is usually still advisable to give them a trial of adequate treatment, since it has been shown that over one-third of them can be improved sufficiently to return to work. Of course, if the same treatment could be provided within the first week after injury, almost twice as many would recover. Providing the patient with early treatment is especially important if he is receiving compensation. The earlier an accurate diagnosis of the need for possible surgery can be obtained, the easier it becomes to treat the patient.

Although there may be no ideal treatment time, we feel from our clinical impressions that a series of 18 treatments or a period of 3 weeks' intensive care, including bed rest and adequate physical therapy, constitutes a fair trial of conservative management. A patient who does not get any relief from these measures during that period should be reviewed with considerable concern. He probably requires surgery, or perhaps his psychological problems are so fixed that little help can be expected from further treatment.

Adequate physical therapy can often do more than directly affect the injury. It can provide an 'out' for the patient's psychological problems if it is started early enough and carried out properly. It is well to encourage this effect by the general approach to the patient. Such an approach consists of maintaining from the outset the attitude that the back disability is only temporary and recommending early settlement of the case. It appears that one can safely recommend to the patient early financial settlement with provision for surgery if it be needed, since the passage of time does not greatly change the results of formal physical therapy. It might be advisable to stress that 'early' settlement refers to prompt settlement after diagnosis and a fair trial of adequate treatment, and not to settlement immediately after the injury.

It is interesting to note that women expecting compensation have shown the worst response to treatment, while receiving the greatest number of treatments. Apparently, many resent that they are required to hold a job, and there seems to be no motive for women with compensable back injuries to return to work. The compensable back injury is so common and its economic implications are so far-reaching that there is real need for further investigation.

* Abstract of an article published in the *Journal of the American Medical Association* (1958): 166, 1128. Published at the request of the Workmen's Compensation Commissioner, Pretoria.

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South African Medical Journal: Suid-Afrikaanse Tydskrif vir Geneeskunde

EDITORIAL

WITHDRAWAL SYMPTOMS

The characteristic abstinence syndrome which occurs when morphine is withdrawn from the addict is well known. The emotional and physical dependence of the addict on the drug is revealed by the features that develop, and authorities now agree that there is an organic basis for the syndrome. The character and severity of the syndrome depends on many factors. Although certain features are determined by psychic factors, most of the signs and symptoms represent an imbalance in the homeostatic adaptive mechanisms which developed in the body during the continued use of morphine.[1] Thus the former opinion that the abstinence syndrome is largely psychogenic in origin arising merely from anxiety and terror is no longer tenable.

The fact that the continued use of barbiturates can lead to addiction has been emphasized in recent years, although it has long been recognized in Germany. Primary barbiturate addiction resembles that to morphine in certain respects but is more serious as a medical problem. It has become an alarmingly common condition. In this country the recent promulgation of the Sixth Schedule, a list of potentially harmful drugs, including the barbiturates, has been designed to prevent easy access of the public to these drugs. Most persons addicted to barbiturates suffer from some basic disorder of character or psychoneurosis. Morphine addicts have used these drugs when the alkaloid was not readily obtainable, and in some instances both types of drug have been taken. Severe and even dangerous symptoms have followed the abrupt withdrawal of barbiturates from addicts. In morphine addiction nalorphine has been used for diagnosis since its administration may produce withdrawal symptoms; in this test for addiction it is advisable to obtain the patient's consent in writing, and reliable witnesses should be present.

When phenobarbitone has been used in the treatment of major epilepsy and for some reason it is decided to discontinue the drug great care is required not to stop administration abruptly, because status epilepticus may occur. If another drug such as phenytoin sodium is to be substituted the phenobarbitone dose should be decreased gradually over a week or so until the substituted anticonvulsant drug is exerting its full action. In the treatment of Parkinsonism, too, the same precautions are necessary; treatment with any drug should not be stopped suddenly but the daily dose should be reduced gradually.

Alcohol is an addiction-forming drug for which physical and organic dependence may develop. Some individuals

VAN DIE REDAKSIE

ONTHOUDINGSIMPTOME

Die tipiese terugtrekkingsindroom wat ontstaan wanneer morfien van die verslaafde onthou word, is goed bekend. Die verslaafde pasiënt se emosionele en liggaamlike afhanklikheid van dié middel word ontbloot deur die simptome wat dán ontwikkel, en die gesaghebbendes is dit nou eens dat daar 'n organiese grondslag vir hierdie sindroom is. Die aard en graad van die sindroom hang van velerlei faktore af. Hoewel sekere kenmerke deur psigiese faktore bepaal word, verteenwoordig die meeste van die tekens en simptome 'n wanverhouding in die homeostatiese aanpassende meganismes wat in die liggaam ontwikkel tydens die volhoue gebruik van morfien.[1] Die voormalige mening dat die onthoudingsindroom hoofsaaklik van psigogeniese oorsprong is en bloot uit angs en vrees spruit, is dus vandag nie meer geldig nie.

Daar is in die afgelope jare klem gelê op die feit dat die voortdurende gebruik van die barbiturate na verslawing kan lei, hoewel hierdie feit reeds lankal in Duitsland erken is. Primêre verslawing aan die barbiturate kom in sommige aspekte ooreen met dié van morfienverslawing, maar as mediese probleem is dit ernstiger. Dit het reeds 'n skrikwekkend algemene kondisie geword. In hierdie land is die doelwit van die onlangse promulgasie van die Sesde Bylaag ('n lys van potensieel skadelike middels wat die barbiturate insluit) om dit vir die publiek moeilik te maak om hierdie middels in die hande te kry. Die meeste slagoffers van barbituraatverslawing ly aan die een of ander grondslagtelike versteuring van karakter of psigoneurose. Verslaafdes aan morfien het ook al hierdie middels gebruik wanneer die alkaloïed nie maklik bekombaar was nie, en daar is gevalle waar albei soorte gebruik was. Ernstige en selfs gevaarlike simptome het gevolg wanneer barbiturate plotseling van verslaafdes weerhou word. By morfienverslawing is nalorfien gebruik by die diagnose aangesien die toediening daarvan ook onthoudingsimptome kan veroorsaak; by hierdie toets vir verslawing is dit raadsaam om die pasiënt se skriftelike toestemming te verkry, en betroubare getuies behoort teenwoordig te wees.

Wanneer fenobarbitoon in die behandeling van ernstige epilepsie gebruik word en daar word om die een of ander rede besluit om toediening te staak, moet groot sorg gedra word dat die onttrekking nie skielik geskied nie, aangesien status epilepticus kan voorkom. Indien die fenobarbitoon vervang gaan word deur 'n ander middel soos fenitoïen natrium, moet die dosis van die eersgenoemde geleidelik oor 'n week of langer verminder word totdat die plaasvervangende stuipebestrydende middel sy volle krag uitoefen. Dieselfde voorsorgsmaatreëls behoort toegepas te word by die behandeling van Parkinsonisme; die toediening van enige middel moet nie skielik gestaak word nie, maar die daaglikse dosis moet geleidelik verminder word.

Alkohol is nog 'n middel wat sy slagoffers liggaamlik en organies aan hom kan verslaaf. Sommige mense kan

may be tolerant to this drug and not develop withdrawal symptoms. Sudden deprivation of alcohol in some heavy drinkers may be followed by delirium tremens. Paraldehyde addicts have also experienced delirium tremens.

Much remains to be learned about the value of the numerous drugs reputed to act as tranquillizers. Some may not be very potent but amongst those which are extensively used important pharmacodynamic action does occur, and many toxic features, some of them severe, are being reported. With meprobamate (Milltown, Equanil, Mepavlon) withdrawal of the drug may cause symptoms resembling those of the barbiturate abstinence syndrome, including insomnia, ataxias, hallucinations, confusion, and grand mal seizures.[2,3]

The xanthine beverages are widely used. It appears to be accepted that the withdrawal of caffeine in individuals habituated to it sometimes results in a 'caffeine-withdrawal' headache, relieved by caffeine and of course by analgesic preparations containing caffeine.

Much stress has been laid on the importance of avoiding abrupt withdrawal of certain hormones used in therapy. Thus with corticotrophin (ACTH) the hypertrophied and overactive adrenal cortex, suddenly deprived of its stimulus, may remain inactive and a state like Addison's disease may develop. With cortisone and related analogues the abrupt withdrawal of the steroid at the end of a course of treatment may lead to the development of adrenocortical insufficiency.

Although strictly speaking it is not relevant to the present theme the opportunity may be taken to mention the general principle that in chemotherapy treatment should not be stopped too soon—for example, when the raised temperature has just been reduced to normal level. This introduces the danger of recurrence of the infection, possibly now more resistant to the drug originally exhibited.

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3. Ewing, J. A. and Haizlip, T. M. (1958): Brit. Med. J., 1, 160.

hierdie middel verdra en by hulle ontwikkel geen onthoudingsimptome nie. Skielike ontneming van alkohol van party kwaai drinkers kan delirium tremens as gevolg hê. Delirium tremens kom ook by paraldehiedverslaafdes voor.

Ons moet nog baie leer omtrent die waarde van die talryke middels wat na bewering as kalmeermiddels werk. Party van hulle is glo nie baie sterk nie, maar by party wat grootskaals gebruik word kom daar 'n belangrike farmakodinamiese aksie voor; en baie vergiftigende kenmerke, waarvan sommige vry ernstig is, word gerapporteer. By meprobamaat (Milltown, Equanil, Mepavlon) kan terugtrekking van dié middel simptome veroorsaak ooreenkomstig met dié van die barbituraat-onthoudingsindroom, onder meer slapeloosheid, koördinasiesteurings, hallusinasies, verwarring en grand mal-aanvalle.[2,3] Die ksantiendrankies word oral gebruik. Dit word blykbaar aanvaar dat die onthouding van kaffeïen van indiwidue wat daaraan gewoond is, soms gevolg word deur 'n ‚kaffeïen-onthouding'-hoofpyn, wat verlig word deur kaffeïen en natuurlik deur pyndodende preparate wat kaffeïen bevat.

Daar word veel nadruk gelê op hoe belangrik dit is om skielike staking van sekere hormone by behandeling te vermy. Met kortikotrofien (ACTH) byvoorbeeld, kan die hipertrofiese en oor-aktiewe bynierskors onmagtig bly as dit skielik van sy stimuleerder beroof word, en 'n toestand soos Addison se siekte kan ontstaan. Met kortisoon en verwante analoë kan die skielike onthouding van die steroïed aan die einde van 'n behandelingskursus aanleiding gee tot die ontwikkeling van gebrekkige bynierskors-funksie.

Hoewel dit streng gesproke nie betrekking op die huidige onderwerp het nie, kan ons van die geleentheid gebruik maak om melding te maak van die algemene beginsel dat by chemoterapie die behandeling nooit te gou gestaak moet word nie—byvoorbeeld wanneer verhoogde temperatuur so pas na normaal gedaal het. Dit sou die gevaar van opvlamming van die besmetting meebring—'n besmetting wat ná 'n kort behandeling miskien meer weerstand as tevore aan die betrokke middel kan bied.

THE MANAGEMENT OF SCOLIOSIS*

F. J. HEDDEN, B.Sc., M.B., B.Ch. (WALES), F.R.C.S. (ENG.), F.R.C.S. (EDIN.)
Acting Hon. Orthopaedic Surgeon, Orthopaedic Department, Addington Hospital, Durban†

John Cobb of America, recently stated in a lecture in London, that in order to treat scoliosis, 'You don't have to be crazy but it sure helps'! In recent years, however, the management, although still controversial, has gradually progressed along certain sane and definite lines. This has been due, in particular, to the development of accurate measurement of the curves by the method of Ferguson,[1] later modified by Cobb;[2] spinal fusion as a method of treating scoliosis by Hibbs;[3,4] the use of a correcting turnbuckle jacket by Risser[5] and, finally, the establishment of an accurate prognosis in idiopathic scoliosis by Ponseti and Friedman.[6]

Scoliosis is a lateral curvature of the spine and consists of 2-4 curves. The commonest pattern is the triple curve with a primary or major curve in the middle, and two secondary or compensatory curves, one above and one below-which develop later in order to keep the head directly above the pelvis. The major curve undergoes secondary changes, consisting of fixed rotation of the bodies of the vertebrae so that the spinous processes are rotated to the concavity of the curve, and of wedging of the vertebrae on the concave side. In the secondary curves rotation is much less marked and does not develop until much later. (See Figs. 1 and 3.) Other less common patterns may consist of 2 or 4 curves (see below).

Clinical Examination

Cases of scoliosis are best dealt with in a special clinic so that adequate time can be given to a detailed history and examination of each case. It is useful to record the findings on a special form. The history should include the age of onset of the scoliosis, past illnesses (particularly

* Paper read at the Annual Meeting of the South African Orthopaedic Association, Durban 1956.

† Formerly Senior Registrar, the Royal National Orthopaedic Hospital and the Hospital for Sick Children, Great Ormond Street, London.

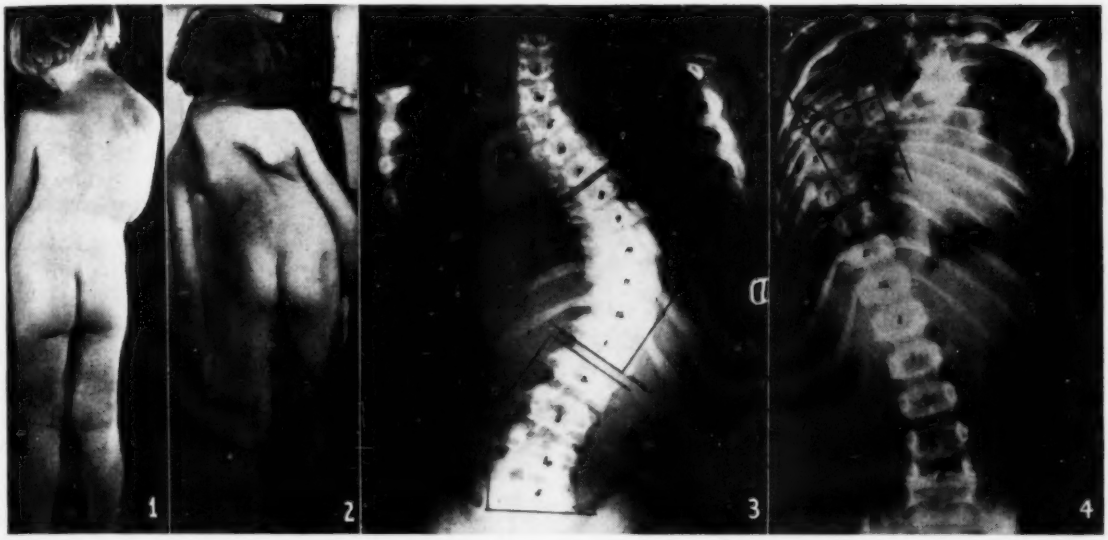


Fig. 1. A typical thoracic scoliosis T2-T11, measuring 79°. *Fig.* 2. A case of neurofibromatosis showing *café au lait* skin pigmentation, and a severe thoracic scoliosis. *Fig.* 3. A thoraco-lumbar idiopathic curve, T8-L1 = 71° (major curve), with upper secondary curve, T2-T7 = 39°, and lower secondary curve, L2-S1 = 35°. *Fig.* 4. X-ray of a case of neurofibromatosis, showing a typical short acute curve T5-T9, measuring 95°.

SCOLIOSIS CHART

Name: *John Jones* — Surgeon *F. J. Hedden*

Diagnosis: *Paralytic Scoliosis* — Record No. 7364

Date		8.4.53	30.9.53	21.7.54	11.1.56	27.1.56
Age		13-1/12	13-6/12	14-2/12	14-7/12	14-7/12
Ht. Standing		60¾″	61″	61¼″	61½″	61½″
Ht. Sitting		31½″	32″	32″	32⅜″	32½″
X-ray Date		8.4.53	30.9.53	21.7.54	11.1.56	27.1.56
	Standing	10	10	18	24	24
(*C3-T5*) Curve	Bending Rt.	12	14	27	31	33
R.	Bending Lt.	−5	−3	4	14	14
Left	Supine	2	5	11	16	17
Rotation (+, ++, etc.)					+	+
Wedging (+, ++, etc.)					+	+
	Standing	24°	20°	43°	57°	63°
(*T6-L2*) Curve	Bending Rt.	5	7	14	27	28
Right	Bending Lt.	26	25	47	73	73
L.	Supine	19	21	24	35	37
Rotation (+, ++, etc.)		+	+	++	++	++
Wedging (+, ++, etc.)				+	+	+
	Standing	8°	14°	19°	27°	27°
(*L3-S1*) Curve	Bending Rt.	10	16	22	28	29
R.	Bending Lt.	−6	−1	3	7	7
Left	Supine	5	9	15	22	24
Rotation (+, ++, etc.)				+	+	+
Wedging (+, ++, etc.)					+	+
Tilt of Lower Curve (*L3-S1*)						7

poliomyelitis), the rapidity of progress of the curve, and whether there is any family history of scoliosis. The examination should be conducted with the child standing and the back should be examined in erect and bending positions. Details of the deformity should be recorded, such as elevation of the shoulder, prominent scapula, list of spine to one side, prominent flank crease and prominent hip. The apex of the major curve should be defined clinically with the child bending forward.

A complete muscle charting should be performed, and the height, weight and leg lengths recorded. The chest deformity should be noted and the vital capacity of the lungs estimated. Finally a careful search should be made for the *café-au-lait* marks on the skin found in neurofibromatosis, and clinical photographs are taken for record purposes (Fig. 2).

X-ray Examination

This consists of routine films taken on 17 × 14 inch plates. These are AP erect and supine of the whole spine, and also a lateral of the spine on the first visit of the patient. *Bending films* are taken with the patient bending first to the right and then to the left to determine the rigidity of the curves. In a paralytic curve after poliomyelitis, a tilt film is also taken (see below).

The angles of the curves are measured and recorded. The limit of each curve is distinguished by noting that, whereas in the primary curve the disc is widened on one side, in the curve above or below it is widened on the opposite side. At each junction there is a neutral disc equal in width on both sides. Lines are drawn parallel to the lower border of the lowest vertebra and the upper border of the highest vertebra of each curve. From these lines perpendiculars are erected, and the angles at which these meet are the angles of the curves. The degree of wedging and rotation of the vertebrae is also noted (see Fig. 3). The results should be recorded on the special Scoliosis Chart shown here.

Finally, the child should be seen every 3 months, or later 6 months, for clinical examination and X-ray, until spinal growth has ceased and there is no further increase of the curve.

CLASSIFICATION BY AETIOLOGY

The aetiology of the case must now be accurately determined. In this paper the subject is considered in accordance with the following aetiological classification:

A. *Functional*
   1. Postural
   2. Compensatory

B. *Structural*
   1. Idiopathic Scoliosis, i.e. scoliosis in which the exact aetiology is not known, constitutes 80-90% of all cases
   2. Post-poliomyelitis 5-10%
   3. Neurofibromatosis 2%
   4. Congenital cases less than 2%
   5. Thoracogenic cases (post-empyema, post-thoracoplasty) less than 2%
   6. Osteochondrodystrophy (Morquio's disease) less than 1%
   7. Friedrich's Ataxia less than 1%
   8. Spastic Paralysis and Rickets—very rare.

A. Functional

1. *Postural Scoliosis.* In postural scoliosis there is a mild single lateral curve, which disappears on suspension or on bending forward. Rotation of the vertebrae does not occur, and the curve does not change into a structural one.

2. *Compensatory Scoliosis* is due to a short leg or to deformity of the hip joint. It shows two curves without rotation, commencing at the level of the lumbo-sacral joint. It does not progress and only rarely, if ever, becomes a fixed structural curve.

B. Structural

Structural Scoliosis is a lateral curvature of the spine with rotation of the vertebrae.

1. *Idiopathic Scoliosis*

The natural history and prognosis of the curve have been described by Ponseti and Friedman,[6] of America, and James, of London,[7,8] and are of the utmost importance in treatment. The higher the site of the primary curve and the earlier its onset, the worse is the prognosis. The onset may be at any age in childhood.

Risser's sign[5] is useful in the prognosis. It is said to be positive when the iliac apophysis appears in the radiograph all the way round the crests, from the anterior to the posterior superior spines. This coincides with the fusion of the vertebral epiphyses, following which, as there is no further growth, no further deterioration in the curve will occur. In girls, the onset of menstruation usually precedes this sign by a few months.

The *severity* of the curves are: (1) mild, i.e. less than 70°, (2) severe 70-100°, (3) very severe—over 100°.

Idiopathic scoliosis is commoner in girls than boys and the curve is commoner to the right, with one exception only (see (*a*) (iii) below).

(*a*) *Lumbar Idiopathic Scoliosis* occurs in 26% of cases. The apex is at L. 1 usually, and the curve extends from T. 11 to L. 3. 91% are mild and the deformity is slight because no ribs are involved and the shoulders remain level. The prognosis is good, and none of the cases need correction or fusion. The only complication is low back pain in middle life from arthritis of the posterior intervertebral joints due to their extreme rotation.

(*b*) *Thoraco-lumbar Scoliosis* occurs in 8% of cases. The apex of the curve is at T. 11 or 12 and extends from T. 6 or 7 to L. 1 or 2. Two-thirds are mild and only one-third become severe, and deformity is not usually marked except in severe cases, where ribs are involved and the shoulders drop and the hip becomes prominent (Fig. 3).

(*c*) *Thoracic Scoliosis* occurs in 43%. This is the most important group, for in these cases the curves progress more rapidly than in other types, giving the largest curves and producing the worst deformities. The apex of the curve is between T. 6 and T. 10, and the vertebrae show marked wedging, rotation and osteoporosis. They are classified according to the age of onset, and occur mainly in the 3 periods of rapid growth:

(i) The *adolescent* group, commencing after the age of 10 years (21%).

(ii) The *juvenile* group, commencing between the ages of 5 and 8 years (5%). The cases in groups (i) and (ii) are commoner in girls and the curves are mainly to the right in both groups. The prognosis is bad; 60% of the adolescent cases and 85% of the juvenile develop severe curves.

(iii) The *infantile* thoracic group commences before 3 years of age (17%). It is commoner in boys

and the curve is more often to the left, making this a distinct pattern from the previous thoracic curves. The deformity is severe, rotation occurs early, and over 90% of cases are severe by the age of 10 years. The prognosis is very bad in the majority of cases; although in a few the condition remains stationary or disappears, in the majority it progresses steadily.

(*d*) *Combined Thoracic and Lumbar Scoliosis* occurs in 23%. This combines the characteristics of both lumbar and thoracic scoliosis, and has 4 curves—2 primary in the middle with rotation, and 2 secondary. The upper primary curve is usually from T. 6 to T. 10, and the lower primary from T. 11 to L. 4. The two curves keep in step and balance each other, and the deformity is slight, for the shoulders remain level and the hips are covered. The prognosis is good.

2. *Paralytic Scoliosis*[9]

Scoliosis is common in a growing child after an attack of poliomyelitis with paralysis of the trunk muscles. There are two main groups (Fig. 5).

(*a*) Firstly severe symmetrical paralysis, which causes a collapsing spine, as the spine is unstable in the erect position, but does not give a severe curve. It is due to the force of gravity.

(*b*) Secondly, and more commonly, a curve develops from asymmetrical weakness of the trunk muscles plus the force of gravity, the convexity developing on the weaker side. The muscles which cause the scoliosis are the intercostals, the lateral abdominals and the quadratus lumborum. Even moderate inequality in these muscles on the two sides will produce a definite curve. A scoliosis may develop soon after the attack of poliomyelitis, or it may be delayed 5-10 years; so a careful watch must always be kept on the spine. The erector spinae, shoulder muscles, anterior abdominals and leg muscles do not cause scoliosis, although a contracture of the tensor fascia lata may cause pelvic tilting.

The curve patterns have some similarity to idiopathic scoliosis, but their prognosis is different (Fig. 6):

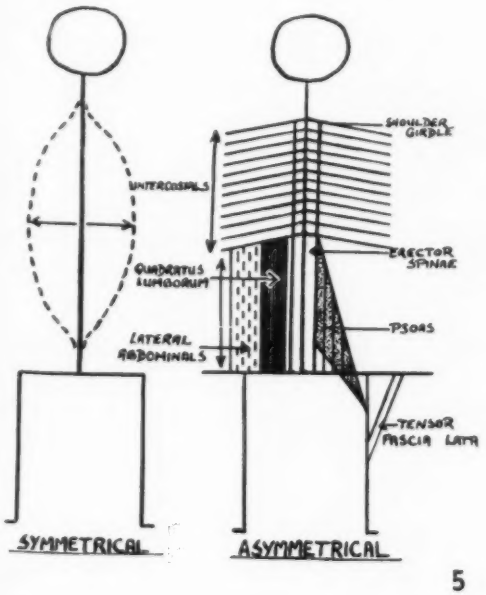
The Lumbar (Apex at L. 1—L. 2) and *Thoraco-lumbar* (Apex T. 11 or T. 12) are due to weakness of the lateral abdominals and quadratus lumborum muscles, and the *Thoracic* are due to the additional weakness of the lower intercostals (Figs. 10, 7, 8, 9). These curves may progress and cause severe deformity, but they can be corrected surgically.

High Thoracic curves starting at C. 1 or C. 2 are due to paralysis of the intercostals. This can be demonstrated by a cine-film, by the decrease of movement of the ribs on the convex side, and by their more vertical position. The head is stepped to one side and the rotated ribs make the trapezius prominent, causing severe deformity. This curve is very difficult or impossible to correct and has the worst prognosis of all the types of paralytic scoliosis.

Quadruple curves may occur with double primary curves in opposite directions and compensatory curves above and below, and the primaries may not balance each other as in the idiopathic variety.

Pelvic Obliquity may be caused by contracture of the hip abductors and the tensor fasciae latae, paralysis of the lateral abdominals and quadratus lumborum, or a combination of them, and may be associated with a short marked lumbar curve (Fig. 11).

The paralytic curve differs in appearance from the idio-



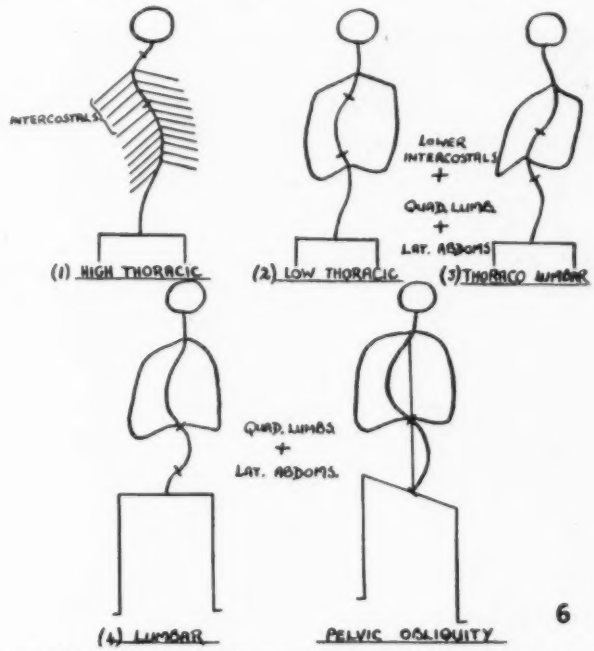


Fig. 5. Diagram showing the two main types of paralytic curve (see text). *Fig.* 6. Curve patterns in paralytic scoliosis due to asymetrical involvement of muscle groups.

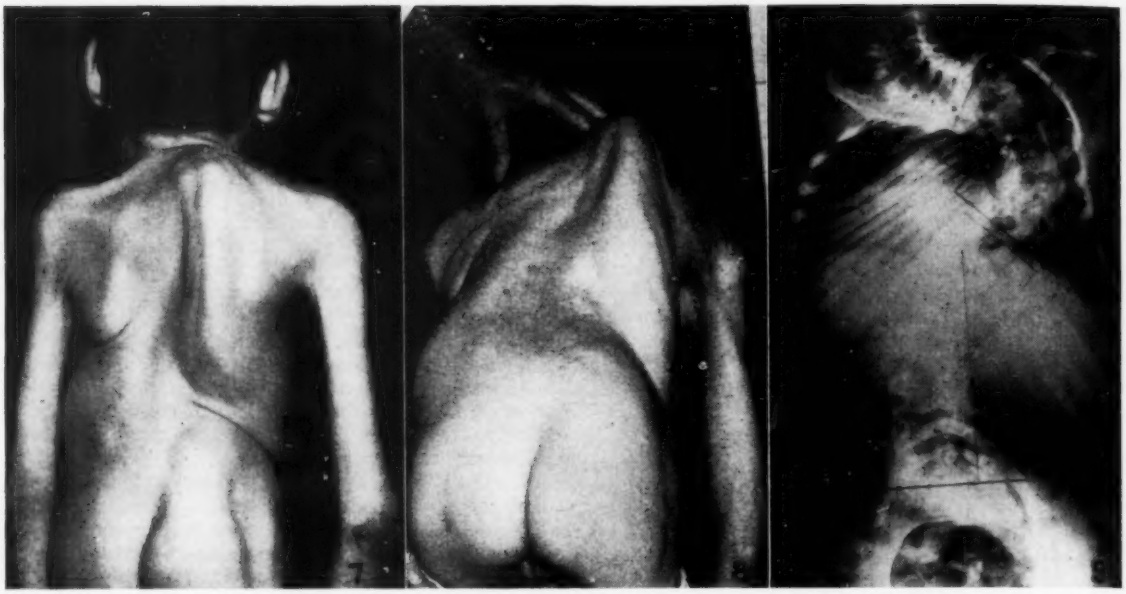


Fig. 7. Thoracic type of paralytic scoliosis. *Fig.* 8. Same case showing the 'razor back' type of deformity due to rib rotation. *Fig.* 9. Same case. X-ray shows curve T3-T10 measuring 104°.

pathic and is typically a long C-curve with secondary compensatory curves. No accurate prognosis can be given in paralytic curves, owing to the difficulty in accurate charting of the affected muscles, but the earlier the onset and the higher the curves (as in idiopathic) and the greater the muscle imbalance, the worse the prognosis. However, unlike the idiopathic variety, the lumbar and thoraco-lumbar curves may cause great deformity.

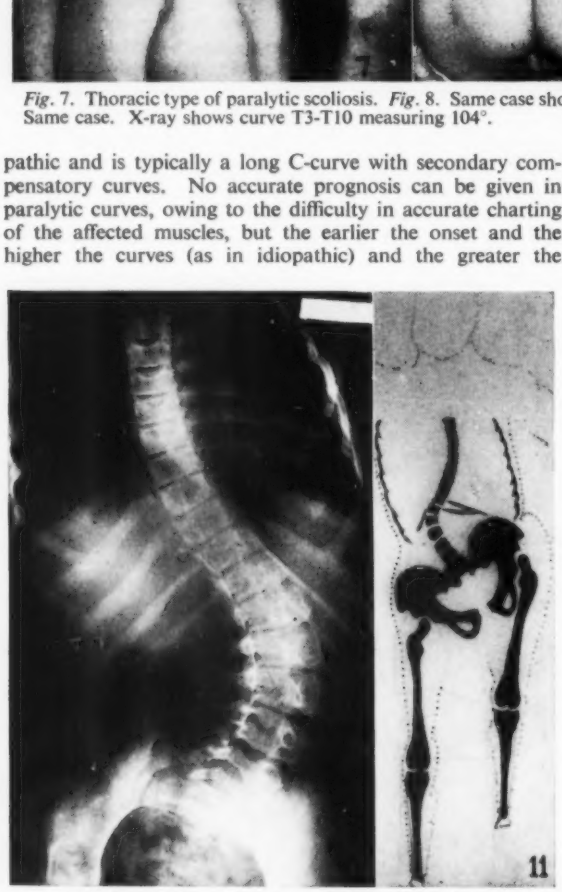


Fig. 10. Lumbar type of paralytic scoliosis. A typical long curve T9-S1 = 53°. *Fig.* 11. Diagram showing a scoliosis associated with tilting of the pelvis.

3. *Neurofibromatosis*

A number of cases of neurofibromatosis develop scoliosis. The typical cases develop a short, sharp, acute angulating curve with wedging of vertebrae in the thoracic region. They all progress rapidly, causing severe deformity, and have the worst prognosis of any kind of scoliosis. Paraplegia may be a complication in severe cases (Fig. 4).

4. *Congenital*

Many types of abnormality may occur in the spine, such as hemi-vertebra, fused vertebra, spina bifida. The degree of scoliosis varies from mild to severe, as one hemi-vertebra may cancel out another. Nearly all double curves (except compensatory) are congenital. Prognosis based on X-rays is often impossible, and the curves have to be watched carefully.

Kypho-scoliosis[10]

In structural scoliosis, although there is often an apparent kyphosis due to the hump caused by rib rotation, there is no actual alteration in the anterior-posterior direction of the vertebrae. However, very occasionally a true kyphosis is associated with a structural lateral curvature, when the condition is called kypho-scoliosis.

TREATMENT OF SCOLIOSIS

Treatment may be conservative or operative.

A. *Conservative Treatment*

1. *Physiotherapy* in the form of exercise will improve posture but, whilst breathing exercises are useful, physiotherapy will have no effect on a structural curve. However, in paralytic curves exercises are useful to improve the par-

tially paralysed muscles, but will seldom help after 18-24 months if these muscles are used in everyday activity.

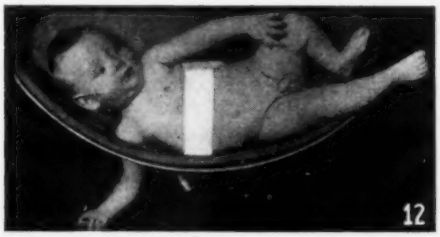


Fig. 12. An infant immobilized in a Dennis Browne metal night splint.

2. *Correcting plaster beds and splints* may be used in infants, such as the Merck-Jansen bed, or the Dennis Browne metal night splint, but neither is of use in older children (Fig. 12).

3. *Plaster jackets and spinal supports* in older children should be avoided as far as possible, as they are only an encumbrance and fail to control the progress of the deformity. There are two exceptions, however:

Firstly in a case where there is a rapidly progressing curve and the patient is too young to operate on, the Milwaukee Brace of Blount[11] is of great value and will control the curve or slow down its rate of increase. Constant distraction of the spine combined with local pressure is obtained by means of a moulded leather pelvic support connected to occipital and chin pieces by extensible anterior and posterior uprights. A lateral pressure pad exerts pressure at the apex of the curve (Figs. 13 and 14).

Secondly, in paralytic curves, when there is a collapsing type of curve without severe scoliosis, the patient is unable to sit up or stand, and a posterior spinal support with axillary crutches is necessary.

B. *Operative Treatment: Correction and Fusion*

The operative correction consists of correction and fusion of the major curve in a turnbuckle plaster jacket.

1. *In Idiopathic Scoliosis*, if the curve pattern and the age of onset are considered together, an accurate prognosis is possible. Correction and fusion should be carried out *for the prevention of future deformity*; and, as there are no symptoms in the idiopathic variety, the indications are mainly cosmetic. Occasionally where there are severe chest deformities and a low vital capacity operation is indicated to prevent pulmonary and cardiovascular complications. Less than 5% of cases of idiopathic scoliosis need operation, and these consist almost entirely of the thoracic group, where the prognosis is bad and severe deformity may develop if untreated. When the deformity is established, the depression of the shoulder and prominence of the hip can be corrected, but the projecting rib hump remains. In a mature child a curve of 65-80° is ugly enough to warrant correction on clinical appearance alone. In a young patient, before deformity is serious, correction is relatively easy and more complete, but it is advisable to delay operation until the age of approximately 10 years to avoid interference with spinal growth or the production of a kyphosis, although in severe rapidly-progressing curves earlier operation may be necessary. Thus in a curve of 55-60° in a child of 10 years, correction and fusion would be indicated because of the bad prognosis.

2. In *Paralytic curves* 50% need operation. These curves are unstable and the treatment of the stability of the spine is more important than the correction of the deformity.

(*a*) In a *flail collapsing spine* scoliosis may develop late owing to gravity and may also be indicated in order to

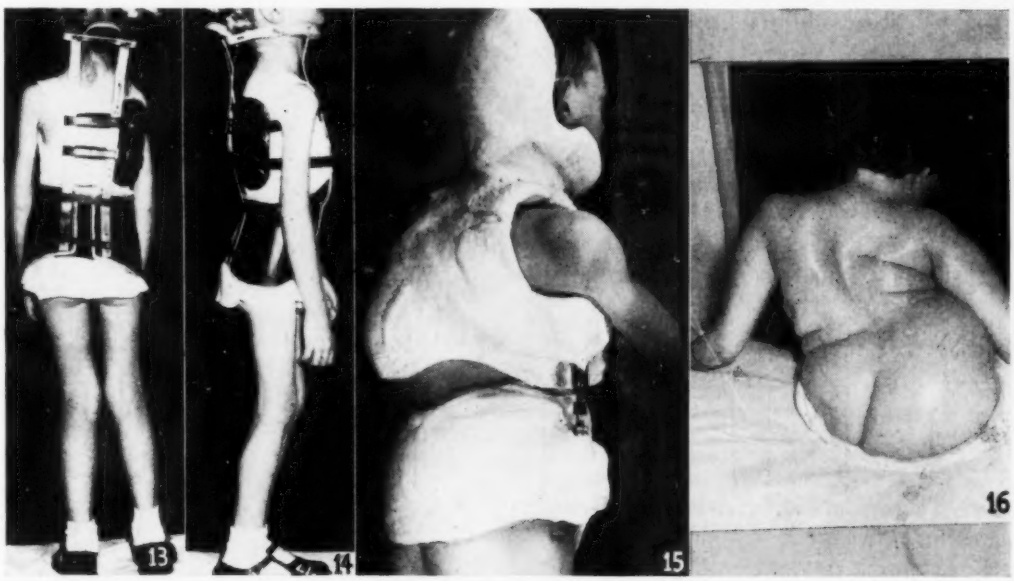


Fig. 13. A Milwaukee brace: posterior view. *Fig.* 14. A Milwaukee brace: side view. *Fig.* 15. A distraction jacket designed by Stagnara. *Fig.* 16. A severe collapsing paralytic curve, necessitating fusion from T2 down to sacrum.

give a rigid link between the trunk and leg. In the latter type, before fusion to the sacrum is performed it is important to establish that the patient has active hip flexors present. If these are absent and the patient has to rely on the lateral abdominals to elevate the pelvis in order to swing the leg clear of the ground in walking, fusion of the spine to the sacrum will stop all walking. However, in a severe case with flail legs and spine, fusion to the sacrum may be indicated to make the patient a good sitter, and allow working at a desk without a back support (viz. Fig. 16).

(*b*) *Unstable paralytic curves* need correction and fusion *firstly* if the curve is rapidly progressing in a young case and the prognosis is bad because of severe muscle imbalance (the fusion should be left until the child is as old as possible but it may have to be done at an early age if there is rapid deterioration); and *secondly* if symptoms are produced such as pain from back fatigue or ribs pressing in the pelvis or if there is displacement of abdominal viscera or kinking of the ureter. Unstable curves become stabilized after cessation of growth of the spine, i.e. after the appearance of Risser's sign, and in some cases this may occur even earlier. In stable curves, further deterioration does not occur, or if it does, is only slight, and operation is for cosmetic reasons.

(*c*) In *high thoracic paralytic curve* correction is difficult, and fusion should be carried out early, before deformity arises.

(*d*) *The lumbar and thoraco-lumbar paralytic curves*, unlike the idiopathic, may become very severe and cause great deformity, but they are easy to correct, although difficult to fuse successfully.

(*e*) *Pelvic obliquity*. Soft-tissue stripping of the contracted lateral abdominal muscles on the concave side, from the crest of the ilium, may be necessary in severe paralytic curves, before correction can be obtained in a plaster jacket. The weaker muscles on the convex side may be reinforced by strips of fascia lata from the iliac crest to the 9th or 10th rib by Meyer's method,[12] or by the more recent method of Clark,[13] in which the tensor fasciae latae and the ilio-tibial band is turned upward and attached to the 9th rib to give a dynamic reinforcement.

3. Nearly all cases of *neurofibromatosis* need operation because of their rapidly developing thoracic curves.

4. *Congenital Scoliosis*. Usually conservative treatment is adequate, but occasionally correction and fusion is indicated. Alternatively, stapling of the thoracic spine or excision of a hemi-vertebrae in the lumbar region has been attempted, but these methods are not generally advised.

5. *Kypho-scoliosis*. In kypho-scoliosis early correction and fusion is indicated, because of the very bad prognosis, and here there is no fear of producing a lordosis by early fusion.

METHOD OF CORRECTION AND FUSION

This consists of fusion of the whole of the primary curve or curves. Before correction and fusion can be attempted the *Mobility of the curves* must be determined in order to ascertain the degree to which it is possible to correct the primary curve, since it is essential to maintain the head over the pelvis so as to keep the patient well balanced. This is determined from the bending film taken originally, and determines the amount of stiffness in the secondary or compensatory curves (Fig. 17).

If, for example the patient has a 90° primary curve and a 45° upper and a 45° lower secondary curve, the bending film may show that these two curves correct to only 15° and 10° respectively in bending, owing to stiffness. The primary curve can then only be corrected to 15°+10° i.e. 25° if the head is to be kept over the pelvis. If the spine is over-corrected, for example to the straight position, as has been done in the past, the result may be disastrous; the patient will look like the leaning tower of Pisa.

In a case of paralytic scoliosis, a tilt film with a 3-inch block under the buttock on the convex side of the lower secondary curve must also be done to be sure that the spine

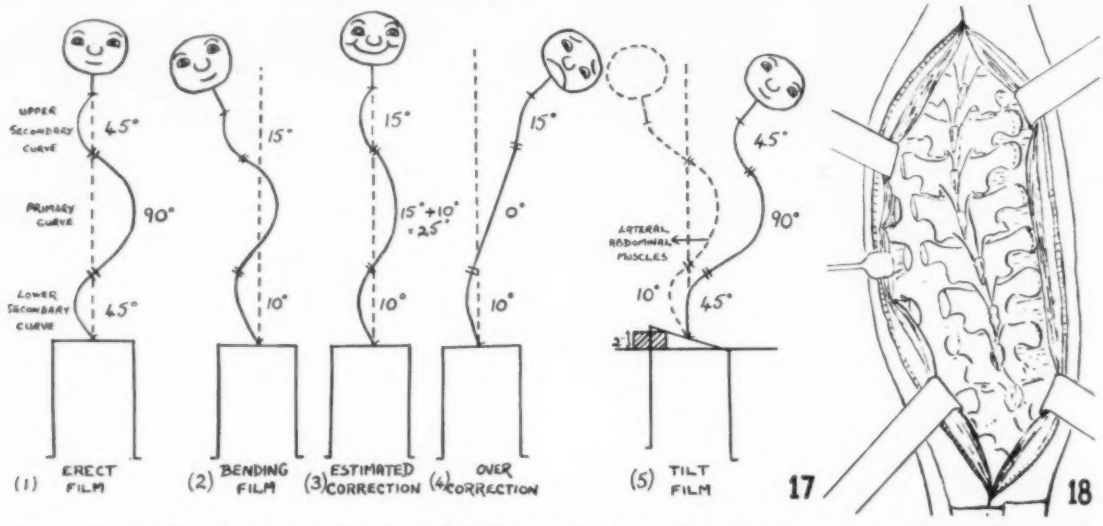


Fig. 17. Diagram illustrating the use of bending and tilt films in estimating the theoretical amount of correction possible. *Fig.* 18. Spinal fusion, showing wide decortication of the laminae, tipping off of the apophyses of the transverse processes, and removal of all soft tissue between the processes.

can be held to the full extent of its mobility, as shown in the bending film, by the weak lateral abdominal muscles (in this particular case held over to a position 10° short of the vertical). If this cannot be done, the fusion must include all the secondary curves down to the sacrum.

Technique of Correction

Correction of the primary curve is achieved by means of a *Risser turnbuckle jacket* (Fig. 19). Felt pads are applied over the bony prominences and over the apex of the curve to prevent undue pressure on the skin (Fig. 20). The jacket is applied standing, with head traction by means of a halter to straighten out the secondary curves, and also to give a good fit for the jacket. It is a full spinal jacket with shoulder straps; the leg on the side of the primary curve is included down to the knee (Fig. 21). Anterior and posterior hinges are placed on the side of the convexity, well lateral to and opposite the apex of the curve, and the turnbuckle screw is placed on the concave side. When the plaster is dry it is cut transversally at the apex of the curve. Correction by elongating the turnbuckle is rapid at first but will later become slower. No discomfort should be produced at any time (Fig. 22). A paralytic curve may correct in a few weeks, but an idiopathic may take up to 10 weeks, and in old patients full correction of the primary curve to the estimated degree may not be possible. When the end-point of correction has been obtained it will be found that the patient tends to slip out of the jacket, instead of being further corrected. Complications are rare with careful nursing, apart from minor pressure sores.

When correction is finished the gap in the plaster is filled in, hinges and turnbuckle are removed, and a window is cut over the spine for operation (Fig. 23). A metal marker is placed over one spinous process and an X-ray is taken to determine the vertebral level.

The *distraction jacket* designed by Stagnara, of Lyons, is useful in correcting the high paralytic thoracic curves, which the Risser jacket fails to correct. It is also used in the combined lumbar and thoracic curve with a double primary curve, and also for correcting kypho-scoliosis. However, there are more risks of pressure sores with this type of jacket than a Risser (Fig. 15).

The *localizer body cast* has been developed by Risser in recent years as an alternative to the turnbuckle jacket.[14] This is a plaster cast applied on a special frame with head and pelvic traction, whilst localized pressure is exerted postero-laterally over the rib angulation, forcing the apex of the curve under the ends of the curve and thereby producing correction. It may be used for conservative treatment or for correction and spinal fusion, and its main advantage is early ambulation.

Technique of Fusion

The method of fusion advocated is that which has been developed by J. I. P. James at the Royal National Orthopaedic Hospital, London. The mechanical force which, after fusion, tends to cause relapse of the curve is a lateral angulating one, and so the aim is to produce a broad, wide fusion area of the whole of the primary curve to combat this. This entails a complete lateral exposure of the spine as far as the apophyses of the transverse processes and meticulous removal of all intervening soft tissue. Profuse haemorrhage results, and it is essential to begin blood transfusion before the operation starts, or severe shock from blood loss may ensue.

If possible the operation is done in one stage, and in a young patient 8 or 9 vertebrae can be fused at one step, but occasionally 2 or even 3 stages are necessary. A large supply of refrigerated stored bone must be available. Boiled bone may be used as an alternative, but it is believed, though this is not yet known for certain, that consolidation of the graft may then take longer than when fresh bone is used.

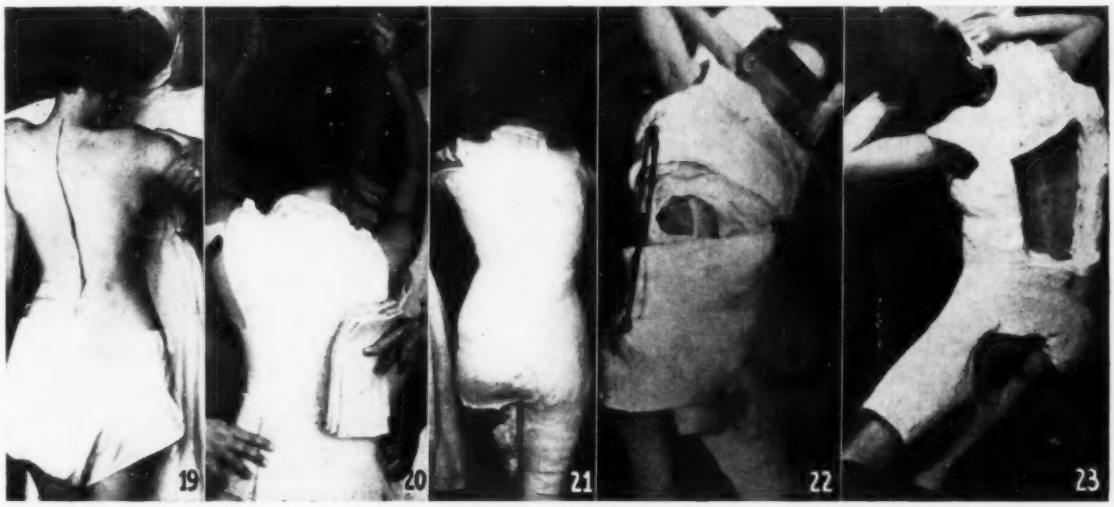


Fig. 19. Application of a Risser jacket, showing patient standing with a thoracic curve marked on skin. *Fig.* 20. Risser jacket, showing application of felt pads over pressure points, and head traction. *Fig.* 21. Risser jacket: plaster of Paris being applied. *Fig.* 22. Risser jacket, showing correction of curve by a turnbuckle. *Fig.* 23. Risser jacket: correction has been completed, and a window cut over spine for operation.

The operation area is towelled off and the site of the original metal marker is preserved on the skin by means of methylene blue, to act as an indicator of the level of spinal processes. A straight skin incision is used from top to bottom of the curve, and the skin flaps are undermined with diathermy. Subperiosteal stripping of the spinous processes, laminae and transverse processes is performed, and the apophyses of the transverse processes are tipped off, to allow the spinal muscles to be retracted as far lateral as possible (Fig. 18). The spinous processes are then removed and the laminae and transverse processes are completely decorticated with a rougine. In older children a power-driven burr may be used instead, and this diminishes shock.

A deep, wide, raw bed is left and this is covered with a large mass of bone chips from the bone bank.

Finally silver clips are placed on the spinous processes above and below the fusion as a radiographic guide, and the wound is closed in layers.

The patient is kept recumbent for 6 months in the Risser jacket, and then is allowed up in a polythene jacket. Alternatively, a Milwaukee brace may be used, particularly if relapse is feared, as in high thoracic cases.

One year after operation bending films of the primary curve are taken to exclude a pseudo-arthrosis and, if satisfactory, all support is abandoned.

Two other operative techniques have been introduced recently but, although they may be indicated in certain cases, as yet they are not recommended in routine work:

Firstly, Allan,[15] of Birmingham, uses a jack which is inserted between the transverse processes on the concave side; the jack is opened, correcting the curve; and finally spinal fusion is performed without post-operative plaster fixation.

Secondly, Roaf,[16] of Oswestry, corrects the apex of the curve by removing a wedge of bone from the convexity of the curve, including laminae, pedicles, transverse processes and adjacent portions of two vertebral bodies and intervening disc.

Results of Fusion

The greater the curve, the greater is the force tending to cause relapse after operation. The average relapse following operation is about 25°. This is usually due to pseudo-arthrosis of the graft, which occurs in about 10% of fusions or else to a too limited fusion of the primary curve.[17] The *preliminary results of fusion* are encouraging, but final assessment of this method of treatment cannot yet be made in a large enough group of cases, until all these spines operated on have ceased to grow, but there is every indication that the present method of managing scoliosis will produce good results and prevent the development of the hideous deformities, which are still only too common.

To Summarize the Treatment of Scoliosis

1. Scoliosis should be dealt with in a special clinic where adequate facilities and time are available. The patients should be checked every 3-6 months until growth of the spine has ceased.

2. In idiopathic scoliosis 5% of the cases need early fusion and correction, mainly in the thoracic type at the age of 10, in which the prognosis is bad.

3. Of paralytic curves 50% need operation because of instability, production of symptoms or deformity, and early fusion is especially indicated in the thoracic type.

4. Nearly all cases of neurofibromatosis need early operation, but this is only rarely necessary in scoliosis of the congenital type.

I wish to express my thanks to Mr. J. I. P. James, of the Royal National Orthopaedic Hospital, London, for his help and encouragement and his permission to publish Fig. 15; and to Mr. G. T. du Toit, of Johannesburg, and Mr. R. C. J. Hill, of Durban, for allowing me the use of their clinical cases.

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MYRINGOPLASTY AND TYMPANOPLASTY

PLASTIC PROCEDURES TO RESTORE HEARING IN MIDDLE EAR DEAFNESS

A. E. AMOILS, M.B., B.CH., D.L.O., F.R.C.S.E., *Johannesburg*

The restoration of hearing in conductive deafness is one of the prominent contributions in the present-day surgery of repair and rehabilitation. Cases can be divided into two groups:

1. Deafness with an intact tympanic membrane, as in otosclerosis, and

2. Deafness with a perforated tympanic membrane, usually resulting from chronic otitis media.

The treatment of otosclerosis by fenestration, and more recently by stapes mobilization, is a well-established procedure, but deafness with perforation of the tympanic membrane has for a long time presented a problem in otorhinolaryngology. This article deals with the restorative techniques developed to treat the latter, which have followed the pioneering works of Zöllner[1-3] and Wüllstein[4,5] in Germany, and Pietrantoni and Bocca[6] in Italy over the past 6 years. This has resulted in a new approach to these problems, with dramatic restoration of function and elimination of infection from the middle ear.

Normal hearing depends on the integrity of the sound-conducting apparatus, which consists of the tympanic membrane and ossicles, acting as a system of levers in the middle ear. The air-borne sound waves on striking the tympanic membrane set it vibrating. This membrane is

attached to the malleus, which articulates with the incus, and in turn with the stapes, which fits into the oval window. The movements of these ossicles transmit the vibrations of the large tympanic membrane to the much smaller membrane in the oval window, with diminished amplitude but with greater force. The conversion of amplitude to force is necessary to set the inert fluid (the perilymph) of the inner ear in motion.

Movement of the perilymph is dependent on the two bony openings in the cochlea, the oval and round windows; the former has the footplate of the stapes held by the annular ligament, and the latter lies free, covered by a membrane facing into the air-filled middle ear. Compression at the oval window causes a movement of the perilymph on one side of the basilar membrane, and a corresponding movement is transmitted to the round window. This movement of the basilar membrane stimulates the auditory nerve, resulting in the sensation of hearing.[7]

Plastic operations for the repair of perforated ear-drums were described as long ago as 1879 by Berthold.[8] Not until the advent of antibiotics and the binocular microscope has his type of surgery been placed on a firmer footing.

The degree of loss of hearing varies in relation to the destruction of the middle-ear components seen in chronic otitis media. Previously, middle-ear surgery dealt with the elimination of infection to produce a dry ear, as in radical mastoidectomy, and necessitated removal of the tympanic membrane and ossicles. These cases were left with a marked deafness, which has been found, from recent investigations, to be due to the fact that the sound waves strike the oval and round windows almost equally so that little if any movement of the perilymph and basilar membrane results. The advent of chemotherapy and antibiotics has changed the radical tendency of surgery of the temporal bone towards conservation of the middle-ear structures, resulting in improved hearing.

Wüllstein and Zöllner observed in some patients after a radical mastoid operation that the ear operated upon, instead of remaining deaf, had improved. In the past this fact had been realized but never explained. It was concluded that the improvement in hearing was brought about by the accidental growth of epithelial tissue, forming an air-filled compartment for the round window and eustachian tube separated from the rest of the cavity. As a result of this isolation of the oval window from the round window the sound waves strike the two windows unequally, because of the air baffle around the latter. Movement of the perilymph and basilar membrane occurred, and the patients attained socially adequate hearing.

From this observation the fundamental principles of myringoplasty and tympanoplasty were established, that is, to reconstruct a closed tympanic cavity. The essential requirements of such a cavity are a normally functioning eustachian tube, where the ossicular structures must be preserved as far as possible. The round and oval windows must recover their function. Good bone conduction, indicating adequate cochlea reserve, must be present.

Five types of reconstruction procedures are described, which vary with the destruction of the middle-ear components:[9]

1. Lesions affecting the tympanic membrane without damage to the ossicular chain.

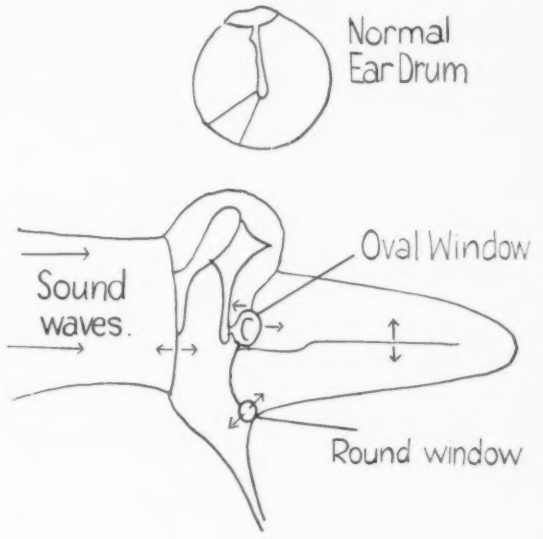
2. Lesions affecting the tympanic membrane with minor damage to the ossicular chain.

3. Lesions affecting the tympanic membrane, tympanic cavity and ossicular chain, without damage to the stapes.

4. Lesions affecting the tympanic membrane, tympanic cavity and ossicular chain, with damage to the stapes.

5. Lesions affecting the tympanic membrane, tympanic cavity and ossicular chain, with fixation of the stapes.

The operations in cases of chronic otitis media aim at complete eradication of disease in the middle ear and temporal bone, and the restoration of the sound-conducting apparatus to improve hearing. This is achieved by retaining the healthy ossicles and forming a closed tympanic cavity, with a full-thickness skin-graft placed over the perforation. The re-



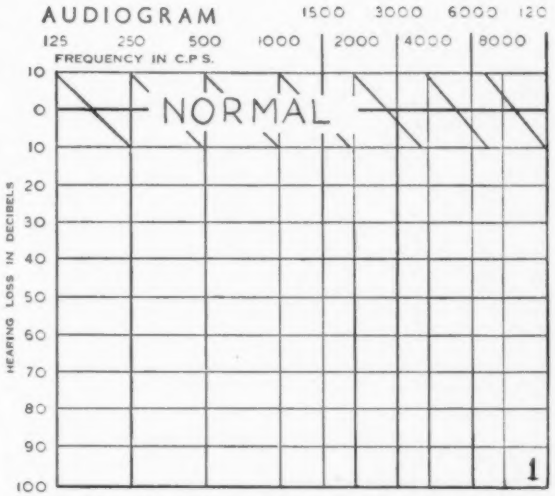
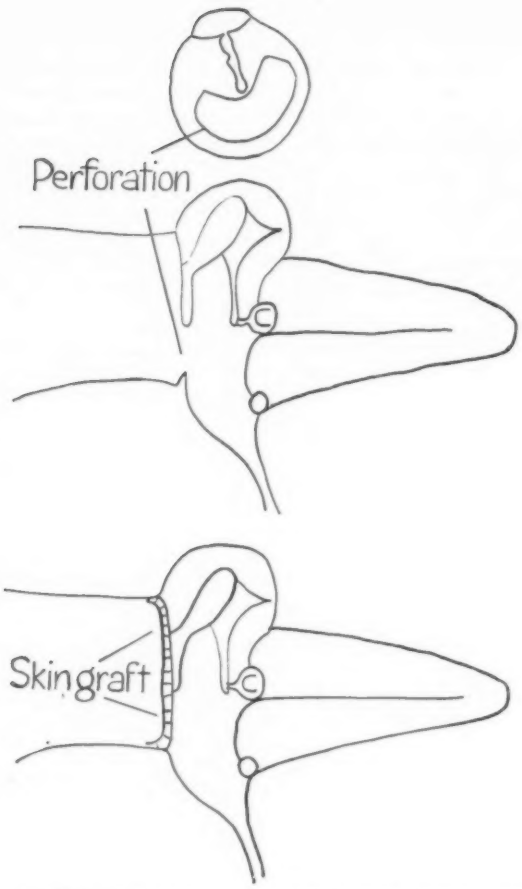


Fig. 1. Normal ear-drum and normal middle ear and ossicles.



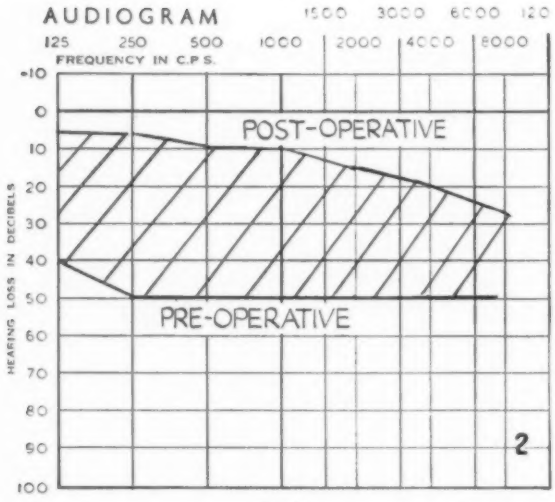
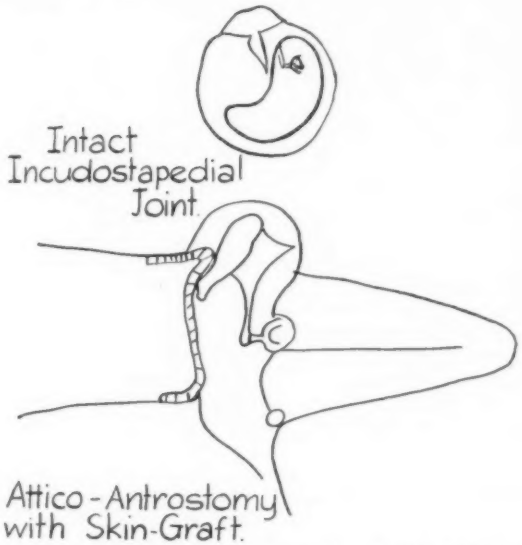


Fig. 2.

constructed tympanic cavity has a normally functioning eustachian tube and functioning round and oval windows which stimulate the basilar membrane.

TYPE I. LESIONS AFFECTING THE TYMPANIC MEMBRANE WITHOUT DAMAGE TO THE OSSICULAR CHAIN

In this stage of the disease, very little damage has resulted to the ear. A dry perforation of the tympanic membrane of varying size is present, following otitis media or traumatic rupture. A mild degree of hearing loss results, approximately 10-35 decibels.[10] There is no sign of active disease or of ossicular damage, although periodic discharge may occur, associated with upper respiratory infection. This causes further damage to the middle-ear structures, and increasing deafness.



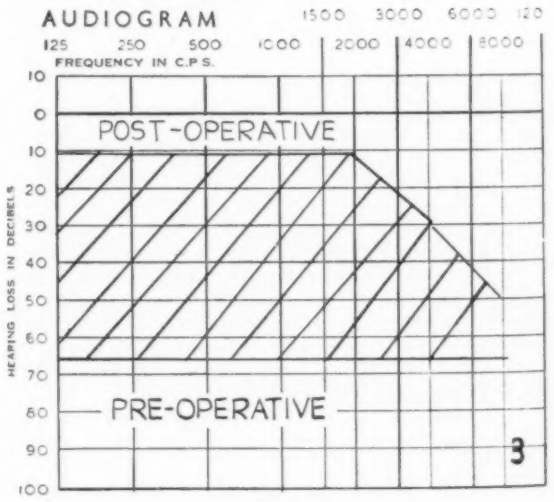
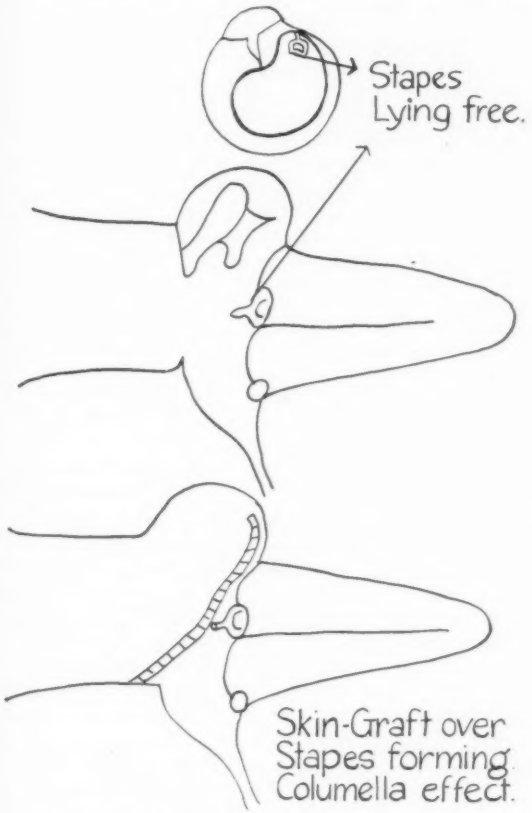


Fig. 3.

Myringoplasty

This operation aims at healing the perforated tympanic membrane, and does not necessitate opening the temporal bone, since the middle ear is free of infection and has been dry for a considerable period. The technique requires the utilization of a full-thickness skin-graft taken from the post-auricular area. An ellipse of skin is removed and thinned by trimming the subcutaneous tissue with curved scissors. Then



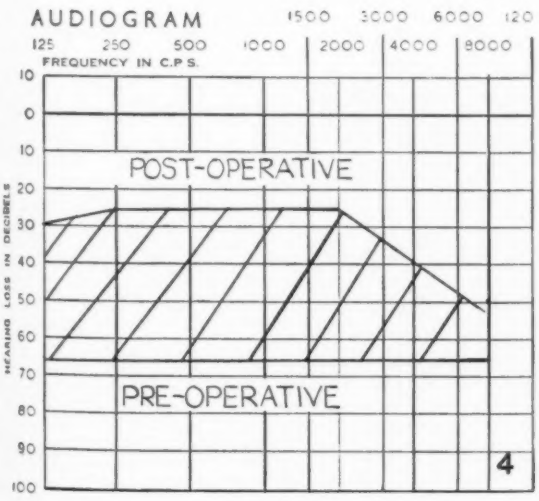
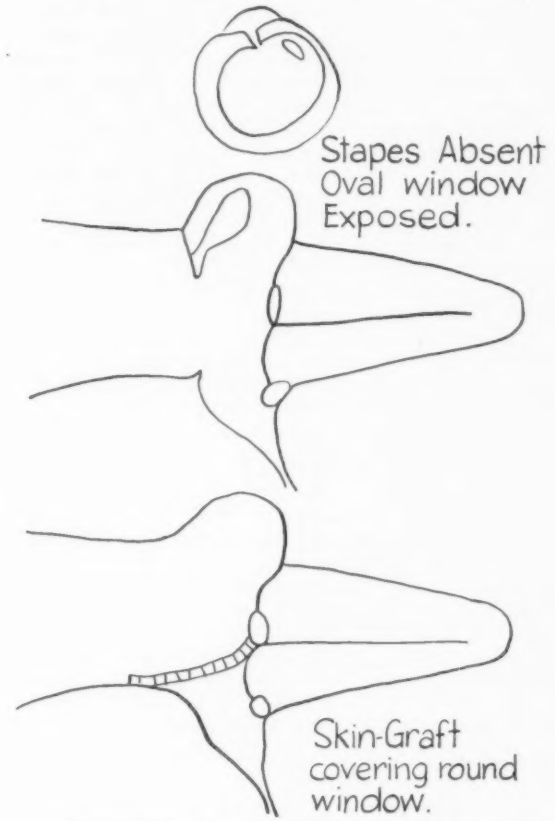


Fig. 4.



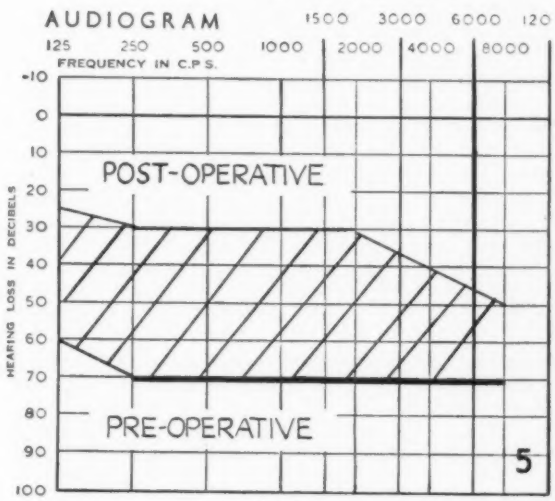


Fig. 5.

the graft is cut to a size to fit the defect. This skin has the advantage of few elastic fibres, and, unlike skin obtained from other parts of the body, does not tend to contract and curl.

With the aid of a binocular dissecting microscope[11] the perforation in the tympanic membrane is inspected through a speculum or, if necessary, the external auditory meatus is widened by a small vertical incision. The skin in the deep bony meatus is incised concentrically around the tympanic membrane, two or three millimetres proximal to it. Then with suitable instruments the meatus is denuded of epithelium and the tympanic membrane detached from the periphery towards the perforation. Small pieces of gelatin foam are placed in the tympanic cavity to act as a support for the skin-graft and to prevent its adhering to the inner wall of the middle ear. The skin-graft is laid on this prepared bed, and held in position by more gelatin foam applied to the outer skin surface. A short length of ribbon gauze helps to maintain pressure.

The dressing is left undisturbed for 10 days, the patient being maintained on antibiotics and instructed against nose-blowing. At the end of 3 weeks the ear may be politzerized, and hearing is usually restored to almost normal.

No further treatment is required and, later on, the patient can resume swimming and bathing without risk of infection.

TYPES II-V

Tympanoplasty

In these more advanced lesions, where the ossicular chain has been damaged, it is necessary to open the temporal bone (attico-antrostomy), in order to eradicate the disease within the middle ear; to ascertain the condition and function of the ossicular chain, the oval and round windows, and the eustachian orifice; and to reconstruct a closed, air-containing tympanic cavity with a whole-thickness skin-graft, in order to restore the functional properties of the middle ear. This procedure has been named 'tympanoplasty'.

Type II. Lesions affecting the tympanic membrane with minor damage to the ossicular chain

In these cases, there is a central perforation of the tympanic membrane associated with active discharge. The hearing loss is not severe, usually being below the 35-decibel level in the speech frequencies.[8]

Before operation a culture and sensitivity test are made of the organisms in the ear discharge, in order that the appropriate ear toilet and antibiotics can be given for a few days.

At operation either the endaural or postaural route may be chosen for the attico-antrostomy. Microscopically the antrum and attic spaces are examined without removal of the bridge. The incus and stapes are freed from adhesions and granulations. The incudo-stapedial joint is examined, and the integrity of the ossicular chain is tested; this can best be observed by the movement seen at the round window when the stapes is made to move. The tympanic cavity and eustachian orifice are examined and cleaned if necessary. The prepared skin-graft is then placed meticulously over the perforation, anteriorly covering the remnants of the tympanic membrane, which has been denuded of its surface epithelium, and reaching the attic and antrum posteriorly. Lying over the bridge it is prevented from adhering to the incus. Gelatin foam is used as a scaffold in the tympanic cavity to prevent the graft from sinking in.

Post-operatively antibiotics are given as a routine measure. The dressing is removed on the 10th day. Auto-inflation is tried after 4 weeks and, if necessary, eustachian inflation by means of eustachian catheterization. Toilet is performed at first twice weekly and then once weekly until the cavity has healed satisfactorily.

Type III. Lesions affecting the tympanic membrane, tympanic cavity and ossicular chain.

The disease in this lesion is more advanced, disrupting the lever system of the ossicles at the junction of incus and stapes. At operation the bony process of the incus is found to be eroded. Here the object of operation is to restore a conducting system. This is achieved by reconstructing the columella mechanism of a bird's middle ear; in satisfactory cases a hearing loss of 60 decibles can be reduced to about 25 decibels below normal.

The operation entails the removal of the malleus, incus, tympanic bridge, and diseased tissue in the tympanum. The round-window reflex is noted when the stapes is moved. The skin-graft is then tailored to lie over the tympanum, supported on gelatin foam except at the head of the stapes, to which it must become adherent to form the 'columella'. This achieves the transformation of sound waves across the middle ear and, with inflation of the middle ear, the air baffle surrounding the round window restores a difference in sound pressure at the oval and round windows, as a result of which hearing becomes socially adequate.

Type IV. Lesions affecting the stapes

In this more extensive form with destruction of the stapes, the skin-graft is placed over the lower portion of the tympanum to form a sound-protecting air-buffer for the round window. Hearing in these cases, which may be between 60-80 decibels below normal, may reach a 30-40 decibel level after operation, and thus socially adequate hearing is attained.

Type V. Lesions with associated fixation of the stapes

These cases are characterized by the exhibition of tympanosclerosis[12] with adhesions, which fixes the stapes. If stapedial mobilization[13] cannot be achieved before placing the skin-graft in position, it is necessary to perform a secondary fenestration of the lateral semicircular canal some months later, when the ear cavity is healed and devoid of infection.

RESULTS

The results of different authors, and those of the present writer, are set out below:

Wüllstein: 350 *cases*

Type	*No. of Cases*	*Improved Hearing*	*No Improvement*	*Aggravated Deafness*
I ..	89	84%	16%	4%
II ..	64	70%	30%	3%
III ..	118	75%	25%	1%
IV ..	37	69%	31%	2%
V ..	42	84%	10%	7%
Pietrantoni and Bocca: 150 *cases*				
I ..	15	100%	—	—
II ..	110	60%	—	13%
V ..	110	60%	—	13%
Ormerod and McLay: 39 *cases*				
I ..	12	75%	33%	0%
II ..	6	67%	0%	33%
III ..	13	62%	23%	15%
IV and V	8	50%	38%	15%

Beales: 57 *cases*

Type	No. of Cases	Improved Hearing	No Improvement	Aggravated Deafness
I and II	13	84%	15%	0%
III ..	21	49%	9%	4%
IV ..	8	63%	12%	2%
Present Author: 34 *cases*				
I ..	10	80%	20%	—
II ..	9	75%	25%	—
III ..	12	75%	25%	—
IV ..	2	50%	50%	—
V ..	1	—	100%	—

SUMMARY

During the past 6 years, operations have been devised to eradicate infection, and to restore the function of the ear in deafness due to discharging ears. The pioneers in this field of plastic surgery are Zöllner and Wüllstein in Germany, and Pietrantoni and Bocca in Italy. From the European continent this work has spread to the rest of the world.

This operation is one of the most important recent developments in surgery of the ear, and aims at forming an air-filled middle-ear cavity by using a full-thickness skin-graft to cover the perforated ear-drum. This requires the aid of a binocular microscope and delicate instruments especially designed for this work.

In the opinion of the authorities quoted, the old 'mastoid operation' should be abandoned in favour of these recent surgical advances.

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OPERATIVE CHOLANGIOGRAPHY*

ERIC SAMUEL and W. TRUBSHAW, *Johannesburg*

The argument about the value of operative cholangiography still remains unsettled. This communication is not an attempt to present a critical assessment of the value of cholangiography[1,2,3] but rather to describe some aspects of the method used by the authors which they believe greatly enhances the value of operative cholangiography.

There can be no doubt that operative cholangiography depends for its success on a high radiographic standard; and this paper describes a relatively simple apparatus which fulfils the requirements for successful operative cholangiography. The apparatus has the basic advantage of being inexpensive and it is well within the capacity of the hospital carpenter's shop to construct.

The desiderata of operative cholangiography may be grouped as: (1) surgical requirements and (2) radiographic requirements.

A. SURGICAL REQUIREMENTS

1. *Rapidity*

Any method which greatly prolongs the operation time must of necessity throw an added strain both on the operating team and the patient and is unlikely to be acceptable as a practical measure.

The use of a polythene catheter to canalize the cystic duct, the injection of water-soluble contrast medium, and the taking of the radiographs, have on an average occupied 7 minutes. In some cases the time has been greater and in others less. No surgeon would begrudge this additional time when the information that can be gained from this method is considered.

2. *Minimum Disturbance of Operating Field*

Any method which disturbs the routine performance of a surgical operation is unlikely to receive general acceptance. The removal of surgical towels etc. with the consequent risk of infection all add to the complexity of a surgical procedure and hamper the usefulness of the method. The apparatus used in this method has been so designed that no disturbance of the routine of cholecystectomy is necessary, no towels etc. have to be removed and, particularly, no disturbance of the surgical team is necessary.

As the dye is introduced *via* the cystic duct, no additional step is added to the operation because identification and isolation of the cystic duct and cystic artery forms one of the basic steps in a cholecystectomy. Whilst in some instances it has not been possible to catheterize the cystic duct because of its small size or because of obstruction from the spiral valve or stone formation within the duct, in the vast majority of cases cholangiography has been carried out *via* the cystic duct.

B. RADIOLOGICAL NECESSITIES

1. The films produced must be of high technical quality. For this reason a portable apparatus and an electrical supply capable of delivering at least 100 KV and 100 MA is essential. Undoubtedly, the disappointment of operative cholangiography as compared with post-operative cholangiography has been the quality of the films. It has been our practice to use a portable apparatus capable of delivering an output of 125 KV and 300 MA so as to obtain satisfactory films. The routine use of a stationary grid (Lysholm) has also immeasurably improved the quality of the films.

2. The portable X-ray unit must have an arm and tube and column of sufficient length so that it can be manipulated into position from the head end of the table without disturbing the surgeon or his assistants.

3. The means of injection of the cystic duct must be such that the surgeon and his team can be well outside the area of radiation and can thus obtain full protection from radiation effects. As any length of polythene tube can be used, it is reasonably easy to make the polythene tube of sufficient length to allow the surgeon to stand outside the radiation beam.

4. *Multiple Films.* A disadvantage of most methods of

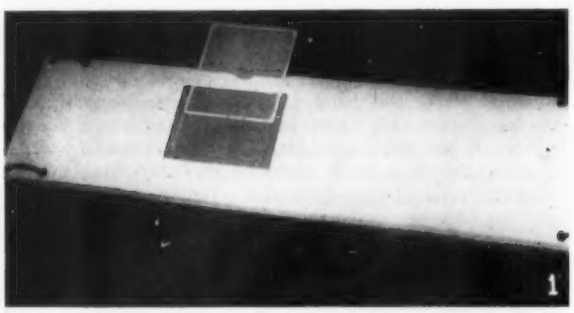
* Based on a paper presented at the South African Medical Congress, Durban, September 1957.

operative cholangiography is the limitation of the number of films obtained.[3] It is a cardinal rule that pathological defects or artefacts can be fairly readily resolved from one another if serial views are available. By the method described, at least 4 films showing various stages of filling of the common duct are obtained, thus enabling artefacts to be readily recognized.

5. *Contrast Medium.* The contrast medium employed must be of the water-soluble variety and one which is not harmful to the patient if extravasation or intravenous spill should occur.

6. *Artefacts.* Undoubtedly, one of the disadvantages of operative cholangiography has been the difficulty of differentiating gas bubbles from retained stones and, although the multiple films used in this method have to a large extent overcome these difficulties, nevertheless, it is obligatory that every effort should be made to prevent the introduction of such bubbles into the ducts. In this method the polythene catheter is fitted with a tap and gasket of the type described by Sven Seldinger,[4] which enables the system to be filled with sterile water, the tap to be closed and the system to remain filled until ready for use. Immediately before insertion of the catheter the tap is partly opened so that a constant drip of sterile water prevents the formation of an air bubble within the catheter during the manipulation necessary to insert the catheter into the cystic duct.

7. *Centering.* By centering slightly to the left of the spine and slightly angling the incident ray by 5° the common duct can be thrown clear of the lumbar spine. The rotation of the patient to the oblique position as advocated by some authors[3] unnecessarily complicates the procedure.



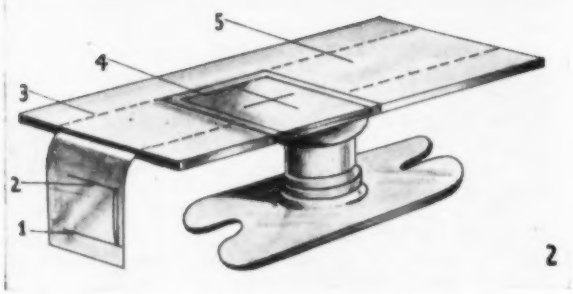


Fig. 1. Cassette tunnel, showing the Lysholm grid partly inserted beneath the perspex window.

Fig. 2. Showing the cassette tunnel in place on the operating table. (1) Linen runner with pockets. (2) Pocket with dummy cassette. (3) Lead-covered upper surface of tunnel; the dotted lines indicate the free portion of the tunnel. (4) Perspex window 12×10 inches with fixed grid beneath the perspex. (5) The lead-covered portion which houses the three unexposed 12×10 inch cassettes.

APPARATUS AND METHODS

The apparatus consists of a wooden cassette tunnel (6×2 feet) exactly the same size as the operating table (Fig. 2). The upper surface of the tunnel is made of lead plywood with the exception of a perspex window in the lead ply. The cassette tunnel does not extend the whole width of the apparatus but only a central tunnel 12 inches in width, slightly eccentrically placed within the apparatus, remains. This tunnel and the perspex window are so decentered in the apparatus that it lies to the right of the midline. (Figs. 1 and 2).

A linen runner is arranged with six pockets, each 12 inches long, so that 12×10 inch cassettes can be accommodated within the runner. Four 12×10 inch cassettes are loaded within the runner so that the first cassette lies in position under the perspex window. The first two pockets in the linen runner are filled with dummy cassettes. The whole apparatus is placed on the operating table and the patient placed in position on top of this apparatus.

The portable X-ray machine is arranged near the head of the table so that the tube arm can be swung into position when required without disturbing any of the surgical team except the anaesthetist, who has to move slightly to the right whilst the linen runner and films are withdrawn from the head end of the table.

Dye is introduced into the biliary system via a polythene catheter, of which the point is coned down in the manner

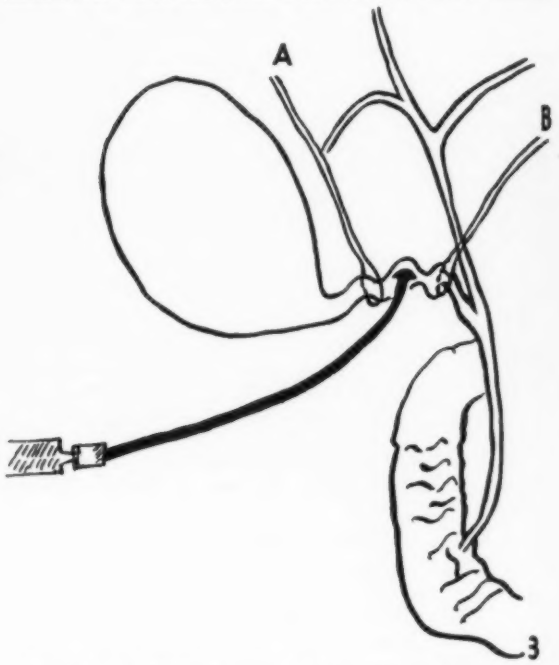


Fig. 3. Pre-cholecystectomy. Demonstrating the catheter in the cystic duct with the two ligatures (A and B) in place.

described by Seldinger,[4] and the distal end is flanged and connected to a gasket (Fig. 4). The polythene tube is filled with sterile water and the tap closed; no fluid will leak from the catheter and it is placed on the instrument tray until required.

The cystic duct is exposed during the routine performance of a cholecystectomy and two thread ligatures are placed around it, the distal one being tied and held and the proximal one allowed loose (Figs. 3 and 5). An incision is made in the cystic duct and the polythene catheter is introduced after the gasket has been connected to a syringe containing 10 ml. of water-soluble contrast medium (Endografin).

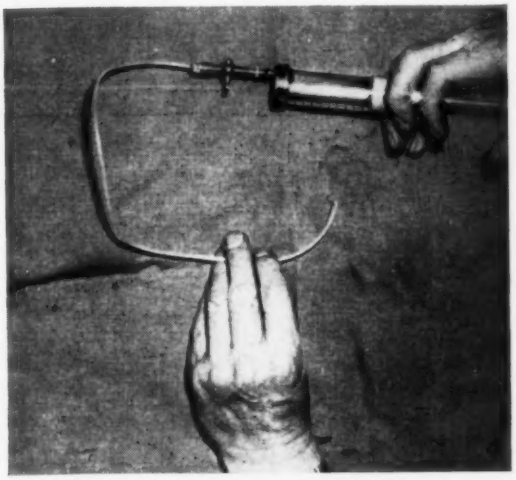


Fig. 4. Showing the polythene catheter affixed to the gasket and tap and the syringe containing contrast medium.

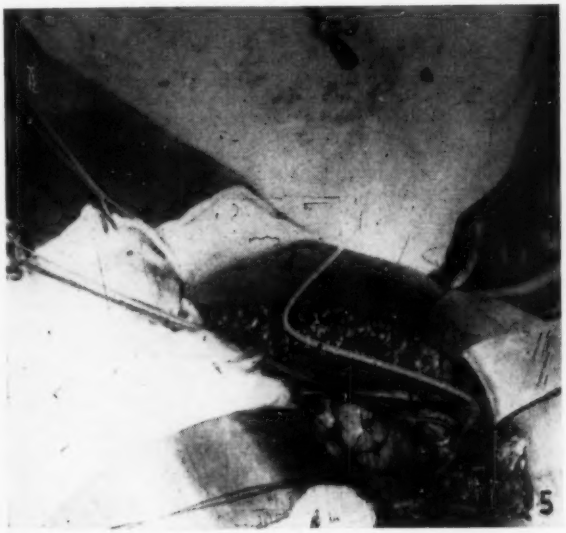


Fig. 5. Demonstrating the catheter entering the cystic duct; the proximal ligature around the cystic duct is seen in the lower left-hand corner. The forceps fixed to the gall-bladder are seen on the left of the illustration.

The proximal ligature on the cystic duct is now tied around the catheter and the dye injected. A technical point during the insertion of the polythene catheter is to partly open the tap, which allows the contained sterile water to slowly

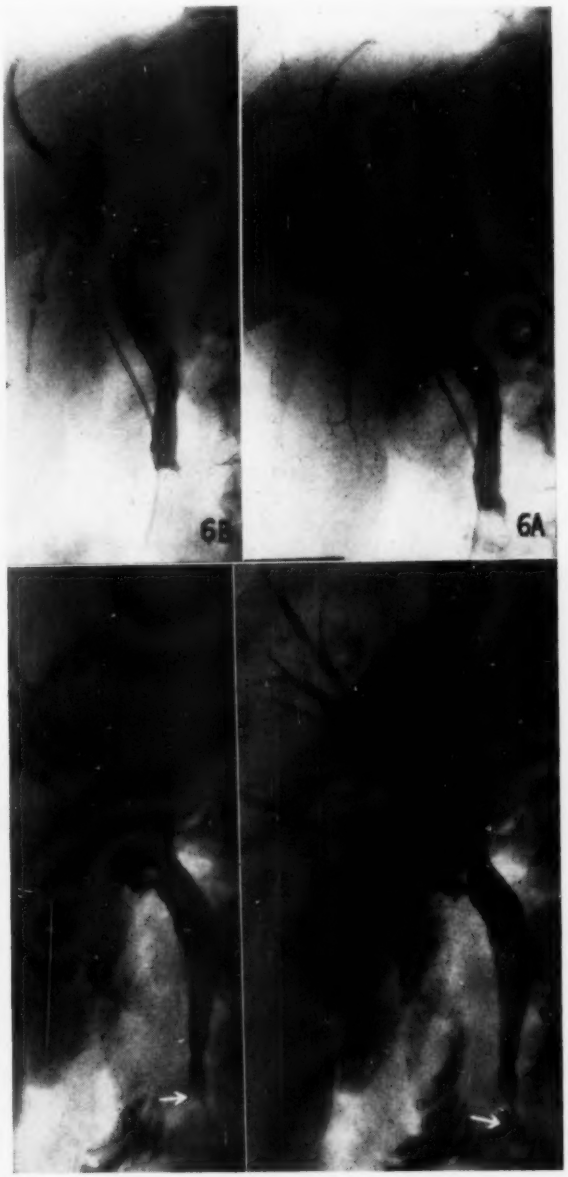


Fig. 6 (A and B). Serial films obtained by this method demonstrating a filling defect present at the lower end of the common bile-duct and indicating a stone lodged at the lower end of the duct.

Fig. 7 (A and B). Films indicating the value of serial films. A negative shadow in the lower end of the duct (7A) is seen in the subsequent films (7B) to be a gas bubble lying in the duodenum.

drop out, thus preventing any bubbles from entering the system. Films are then taken after 5 ml., 7·5 ml. and 10 ml. have been injected and serial films of the differential filling of the ducts are obtained. The catheter is then withdrawn and the cholecystectomy proceeds; the films are developed and are available for inspection immediately (Figs. 6 and 7). When the gall-bladder has been removed and the cystic duct is not available, the bile-ducts are filled by inserting directly into the common duct a needle connected *via* a polythene catheter to the syringe. The insertion of the flexible tube between the penetrating needle and the syringe enables the surgeon's hands to be well outside the range of radiation and also greatly minimizes the risks of the spill of dye which so frequently occurs from a fixed needle and syringe.

No claim for originality is made for the method of using a polythene catheter to inject dye into the cystic duct, but we believe that the method of keeping a system free of air bubbles and the method of obtaining serial films of the filled duct are original in operative cholangiography.

Difficulties have been encountered in the canalization of the cystic duct, and the spiral valve frequently causes unexpected difficulties in inserting the catheter. Nevertheless, in a vast majority of cases a satisfactory canalization can be obtained.

SUMMARY

1. A simple apparatus for the performance of operative cholangiography is described.

2. The apparatus is easy to make, is inexpensive, and allows the taking of serial films of the various phases of filling of the bile-ducts.

3. The apparatus is so designed that no interference with the accepted technique of cholecystectomy occurs.

4. The safeguards from radiation hazards and the production of artefacts on the radiographs are considered.

5. The essential radiographic criteria for the adequate performance of operative cholangiography are discussed and the manner by which they can be obtained is indicated.

6. On an average the performance of a complete cholangiogram by this method adds 5 minutes to the operating time.

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PRESIDENTIAL ADDRESS, NATIONAL CANCER ASSOCIATION OF SOUTH AFRICA*

LEWIS S. ROBERTSON

After referring to the recent death of Dr. C. P. Theron and Mr. Kurt Colsen, who had been actively connected with the National Cancer Association for a number of years, Dr. Robertson said:

Turning now to the Annual Report for the year 1957, we are greatly encouraged to note the progress of the Association.

Finance. The final accounts reveal that the National Cancer Fund subsidized the Association to the extent of £61,560 during the year under review, whereas total receipts of the Fund amounted to £23,786. During the same period the National Cancer Association received an income of approximately £12,000. Viewing the position as a whole, it would be observed that payments exceeded income for the year to the extent of approximately £26,000. Notwithstanding the excess of expenditure over income, the financial situation fortunately remains satisfactory, thanks to the substantial amount previously collected by the National Cancer Appeal Committee. It must be borne in mind that the Association made no special effort during the past year to raise funds. I have no doubt that the public will respond generously when a further appeal for funds has to be launched.

Research. The Annual Report reveals that great progress has been made in its various fields of activity. It is necessary, however, to caution against over optimism in regard to cancer research. Research into cancer is time-consuming and expensive, and no one can guarantee that research will provide the answer to this problem in the foreseeable future. More money is being spent on cancer research in the world today than ever before, and South Africa's contribution, although small, is by no means insignificant.

Cancer Bulletin. Until the cause of cancer or a cure for cancer has been discovered in research laboratories, it is of prime importance for the Association to leave no stone unturned in its efforts to save the lives of those who can be saved by means of early diagnosis and treatment. The Association strives to achieve this object in various ways. In the first place every endeavour is being made to bring to the notice of the medical profession the latest information available on the diagnosis and treatment of cancer. The *South African Cancer Bulletin*, which focuses the attention of the medical profession on problems of diagnosis and treatment, commenced publication during 1957, and the first four quarterly issues have been well received by the medical profession in South Africa and elicited high praise from cancer associations overseas.

* Delivered at the Annual General Meeting, Johannesburg, 4 June 1958.

Films. Valuable additions have been made to the Association's professional film library, and films are becoming more and more in demand by both the medical and nursing professions. There has also been an active interest in these films by medical auxiliaries.

Early Diagnosis and Treatment. However great the efforts of the medical profession may be, these will be of little avail unless individual sufferers from cancer seek early diagnosis and treatment. The Association therefore regards its Public Education programme as of prime importance, and it is in this field of activity that probably the most gratifying progress has been made. Many thousands of pamphlets for the lay public have been distributed and a message of hope has been brought to thousands more by means of personal contact through the Association's exhibit and mobile unit. It has been particularly gratifying to observe how the women of South Africa have cooperated, especially in regard to breast cancer. A matter of the gravest concern to the Association, however, is the apathetic attitude of the male population. For some reason or other, men seem to regard cancer as a women's disease. A warning is issued that such a supposition is entirely erroneous. The misconception is probably due to the frequency of cancer of the breast and cancer of the reproductive organs in women in comparison with the more scattered occurrences of cancer in men. As many males die of cancer as females, and most of the cancers that affect men are more difficult to detect. Common types are cancer of the digestive and respiratory systems. Males also frequently develop cancer of the skin and lip, which are easy to treat, as well as of the prostate gland and the mouth. During 1958 the existing programme of public education will be expanded and additional ways and means of public education will be investigated.

Care of the Cancer Patient. The Cape Western Branch of the Cancer Association has been authorized to conduct a pilot experiment to determine how best the Association can assist the cancer patient. There appears to be every indication that this experiment will be crowned with success and result eventually in rendering worth-while humanitarian services to cancer patients and their dependants.

Cancer of the Skin. Attention is directed to some aspects of cancer which are of public concern. We are apt to forget that cancer of the skin is still the most frequent form of the disease in the world today, because fear has so concentrated our attention on those forms which more often lead to death. We hear little about the triumph of medicine in the cure of skin cancer.

Lung Cancer. Most popular, or perhaps most unpopular, has been the work on smoking and lung cancer. The practical application we look for here is of course the opportunity for prevention. In the last 50 years the insults to which our respiratory systems have been exposed have been increasing, and in consequence the death rate from cancer of the lung has been rising. The recognition that cigarette smoking is an important, probably the most important of the insults responsible, provides an opportunity for those who wish to do so to reduce their lung-cancer risk. This is now clear and should be stated clearly. This does not, however, mean that we should allow our civic authorities to think that we shall relax our efforts to make them do their duty and clean our city air. No one needs to smoke, but we all have to breathe the air around us.

Radiation. A great deal of investigation is proceeding in several countries overseas in regard to radiation therapy, and new improved radiation therapy machines are constantly being constructed. Great strides have been made in radiation therapy, and the justifiable demand for the provision of facilities for adequate radiation therapy must be met by the hospital authorities. Radiation can produce cancer, as well as cure cancer, and in an age in which we are moving over to an economy based on nuclear power, the fear that we may thereby be adding to the cancer burden is ever present in the minds of those responsible for the vast new enterprises.

Conclusion. Let us hope that the research efforts that are being undertaken in many parts of the world will soon throw light on all the dark secrets of cancer, so that the fear and dread which it has inspired in the past may be banished from our lives, as medical science has already banished the fear and dread of so many other diseases.

SOUTH AFRICAN ORTHOPAEDIC ASSOCIATION : CLINICAL MEETING

The following cases were presented at a clinical meeting of the S.A. Orthopaedic Association held at Germiston Hospital, Germiston, Transvaal, on 28 February 1958:

1. *A Case of Ollier's Disease of the Forearm, presented by Mr. W. T. Ross*

The patient was first seen at the age of 13 years. For 3 months before, the wrist had started to become crooked. At the time of the first examination there was 1 inch shortening of the forearm with ulnar deviation of the hand. The rest of the skeleton was normal. X-ray examination revealed marked bowing of the radius and a short ulna.

Mr. Ross said that according to Fairbanks this was a typical case of Ollier's disease. It was shown at the meeting of the Association a year previously, when it was suggested (1) that a portion of the fibula should be substituted for the distal end of the ulna, and (2) that an osteotomy of the radius should be performed. Mr. Ross, however, performed an epiphyseodesis of the distal end of the radius by the stapling method. The arm is naturally still shorter than the normal, but the patient, mother and surgeon are satisfied that the forearm is straighter.

Mr. J. Edelstein said: 'Though prepared to accept the picture in Fairbanks' book, I don't see how this can be called a case of Ollier's disease, because there is no evidence of chondro-osteodystrophy. This is the typical deformity that one gets with failure of development of the distal end of the ulna.'

Mr. C. T. Moller said: 'If one examines the distal end of the ulna closely, there is a lack of tubulation which puts the condition into the metaphyseal aclasis (Ollier's disease) group of dyscrasias'.

2. *Two Cases of Osteoclastoma of the Radius presented by Mr. W. T. Ross*

The first patient was first seen in 1951 with a pathological fracture through an osteoclastoma of the distal end of the radius. Mr. Ross treated the condition by excising the affected end of the radius and substituted the upper end of the fibula, which on X-ray at the time simulated almost exactly the morphology of the discarded bone. X-rays taken 6 years later show that the articular cartilage in the reconstituted wrist joint has largely disappeared. Clinically there is some limitation of wrist movement and the patient states that she experiences some pain in the wrist when doing her work.

The second patient, who also had an osteoclastoma of the distal end of the radius, was treated initially by a general surgeon, who prescribed deep X-ray therapy. The tumour progressed in spite of this. Thereafter, this patient was treated by Mr. Ross by the method of fibular substitution.

Biopsy reports on both tumours showed them to be typical giant-cell tumours.

A step in the technique, is the drilling of a hole through the substituted fibula for the reattachment of the brachioradialis tendon.

Mr. J. J. G. Craig said: 'I agree with the method used as applied to the second case, where it can be regarded as an interim substitution of a bone graft for the length of affected bone with the ultimate object of performing an arthrodesis of the wrist. Tumours of the size encountered in the first case can in the vast majority of cases be cured by the method of meticulous curettage of the cavity followed by the filling of the cavity with cancellous bone chips, and I believe this to be the treatment of choice in cases such as this. The small irregularity of the articular surface of a mal-united fracture of the carpal scaphoid almost inevitably results in a degenerative arthritis of the radiocarpal compartment of the wrist joint. How much more certainly will the incongruity of the opposed surfaces of the head of fibula and carpus produce such degeneration in spite of the pleasing X-ray appearances in these cases!'

Mr. B. Polonsky and *Mr. Edelstein* spoke in favour of curettage and filling the cavity with bone chips, but *Mr. G. D. du Toit* said he had found that treatment disappointing and expressed the opinion that osteo-arthritis of the wrist was a small price to pay for the cure of an osteoclastoma. *Mr. I. Henkel* suggested that the measure of success achieved in the treatment of these cases had little to do with the technique employed, the important thing being the type of tumour concerned.

Mr. G. F. Dommisse, in reply to a question on the use made of the bone bank in Pretoria, stated that it had been established that in bone grafting the efficiency of autogenous bone was only slightly superior to that of homogenous bone. He felt that the indications for the use of bone-bank bone were threefold: (1) In the grafting of an extensive area, where it had its place as an adjuvent to the use of autogenous bone; (2) in those cases where one wished to avoid the mutilation of an already shocked patient; and (3) in children.

3. *A Case of Foot Disability presented by Mr. S. Sacks*

In December 1956 the patient sustained a fracture of the ankle in Rhodesia. Three days later the distal end of the fibula was screwed to the tibia and the limb was immobilized in plaster for 4 months. She now has considerable pain in the ankle and the case is presented for suggestions on treatment. X-ray examination showed a medial displacement of the medial malleolus with increase of the space between the talus and the malleolus on that side.

Mr. van Reenen stated that it was probable that there was non-union of the fracture of the medial malleolus and suggested freshening of the fracture site and screwing of the fragments.

Mr. Klein was of the opinion that reconstructive surgery was not warranted. If the symptoms were sufficiently severe, he recommended arthrodesis, probably of the Charnley type.

Mr. C. Morris suggested that the original operation had been technically unsound in that the adjoining surfaces of the distal ends of the tibia and fibula had not been freshened up, and recommended that this should now be done and that the bone ends should be approximated with a lag screw. *Mr. L. H. Muller* raised the point that it had been established that movement normally takes place at the distal tibio-fibular joint and that this should be retained if possible. He was therefore not in agreement with the fixation of this joint by transfixion with a screw. *Mr. Ross* concurred in the fact that movement is normal at this joint, but felt that the best result could now probably be obtained by arthrodesis. *Mr. de Jager* said that degenerative changes in the ankle joint were probably advanced and recommended arthrodesis. *Mr. Edelstein* was of the opinion that after only 15 months

it was rather premature to arthrodese. He suggested that the pain at present being experienced was due to the presence of the loose screw, and that removal of this would probably give the patient 10 years of relatively symptom-free use of the joint before arthrodesis became necessary.

Mr. Moller expressed the opinion that the disability experienced by the patient was due to the extreme valgus of the affected foot, and suggested that this in turn was due in large part to the shortness of the tendo Achillis.

Mr. Sacks suggested that at this stage the screw should be removed and the ankle joint reconstructed.

4. *A Case of Tendon Transplant in Foot, presented by Mr. S. Sacks*

The patient, now aged 12½ years, was admitted to the Fever Hospital with poliomyelitis in 1948. He had a complete paralysis of the right lower extremity but since that time there has been a partial recovery.

He was seen by Mr. Sacks in 1949, having at that time a marked valgus deformity of the right foot. An outside iron and an inside T-strap was ordered, but in spite of this the valgus increased. In 1954 the extensor hallucis longus tendon was transplanted to the first metatarsal. In 1956 the tendo Achillis was lengthened. The longitudinal arch of the foot is now well reconstituted and the patient walks well.

Mr. Sacks made the point that he does not transplant the extensor hallucis longus tendon into the neck of the first metatarsal, but into the mid-shaft; he finds that this gives a better result.

Mr. Morris said this was a wonderful example of the balancing of the foot, which should be embarked upon as soon as possible, as it gave one a better foot to work on if a stabilization later became necessary.

Mr. G. T. du Toit mentioned that in this type of case, after a swing from tendon transplantations to bone operations, operations on tendons were again enjoying a wave of popularity. If faced with the problem initially, he would have done a Grice operation, and been tempted a year or two later to transplant the extensor hallucis longus tendon to a more central position in the foot.

Mr. Henkel stated that recent tests had shown that the tibialis anticus has 3 times the power of the extensor hallucis longus, and the latter could, therefore, at best be used to balance the foot for varus and valgus. *Mr. du Toit* raised the point that one sees cases with no tibialis anticus power but with a good extensor hallucis longus and tibialis posticus, giving so well balanced a foot that no operation was indicated.

Mr. Edelstein said that his experience of this operation had not been so gratifying as the result in this case. It had, however, proved useful when combined with inter-phalangeal fusion in those cases where there is a tendency to cock up the great toe.

Mr. B. Polonsky brought to the notice of the meeting the operation of talo-navicular fusion, which he had found useful in treating this type of valgus foot. The alignment of the foot was greatly improved by this procedure even though it might later be necessary to perform a triple arthrodesis. *Mr. Ross* recorded similar pleasing results from a talo-navicular fusion which, as he pointed out, was performed by Bankart before World War II. *Mr. Edelstein* expressed the opinion that equally gratifying results could be obtained by the Grice operation, which did not entail fusing any joints in so young a child.

Mr. Sacks asked whether anybody present had seen an extensor hallucis tendon transplant which did not later require stabilization. *Mr. Moller* was of the opinion that the secret of success in this case had been the lengthening of the tendo Achillis, and not the extensor hallucis longus transplant. It had been his experience that all these tendon transplant cases later came to stabilization.

5. *A Case of Disability of the Knee presented by Mr. S. Sacks*

The patient, a male aged 40 years, complained of pain above and medial to the upper pole of the left patella. The pain was aggravated by bumps on the knee and by the weight of his child sitting on the knee. He had fallen from a bicycle at the age of 15 years, and had experienced intermittent pain and swelling of the knee since that time. Clinically nothing abnormal was detected in the knee, the only positive finding being ¾ inch of wasting of the quadriceps.

Mr. Sacks had been of the opinion that the pain was probably due to a neuroma, and had embarked on an operation to deal with this. He carried out a serial dissection of the overlying tissues and finished up by performing an arthrotomy, but found nothing. The pain persists. X-ray examination revealed nothing of significance, and there had been no change in the X-ray appearances during the past 4 years.

Mr. Morris believed that the pathology lay in the suprapatellar pouch, having in mind a glioma. He suggested a synovectomy of the suprapatellar pouch.

Mr. I. S. de Wet said that it would appear that there was a disturbance of the trabeculatin at the lower end of the femur, which might indicate the presence of an osteoid osteoma, and suggested the taking of tomographs. *Mr. du Toit* said he had seen a similar case involving the wrist, in which ordinary X-rays revealed nothing, but in which tomographs had shown an osteoid osteoma which was confirmed at operation. In the light of this experience, he suggested minute tomography in this case.

6. *A Case of a Stab Wound of the Neck complicated by Nerve Injury, presented by Mr. C. M. Sarkin.*

The patient was involved in a stabbing incident 3 weeks previously. Examination of the left shoulder showed that he had no power of abduction or external rotation. Internal rotation was performed by the pectoralis major muscle only. The biceps, triceps, supinator and pronator muscles were found to be normal. There was no Horner's syndrome. Anaesthesia was found to be present in the C5/6 dermatome. There was a 1 inch stab wound in the left trapezius above the shoulder and a small stab wound in the neck immediately above the clavicle. This latter wound had resulted in a tender scar, pressure on which gave rise to a burning sensation down the lateral aspect of the left arm and forearm. There was wasting of the left deltoid, supraspinatus and infraspinatus muscles.

Mr. de Wet was of the opinion that there was a partial lesion of the C5/6 trunk. He suggested 3 months' rest on an abduction frame. If there was no improvement, then one should carry out an exploration. *Mr. van Reenen* suggested that if there was no recovery in 3-6 months, then the shoulder should be arthrodesed.

Mr. Ross advised immediate exploration because the trauma in this case had been a clean cut as opposed to the usual traction injury. *Mr. Dommisse* said that in these cases regeneration after suturing a clean cut found at exploration was so slow and uncertain that he would recommend early arthrodesis.

Mr. Sacks advised that the site of the lesion should be explored and the nerve given a chance to recover. *Mr. Moller* suggested that an exploration should be carried out if only to determine the prognosis, and that the affected nerve should be sutured if possible. If this was not feasible, an arthrodesis should be carried out.

POLIOMYELITIS : STATEMENT BY MINISTER OF HEALTH

An appeal to the public to make full use of the facilities for vaccination against poliomyelitis that exists in the Union was made by the Minister of Health, Mr. M. D. C. de Wet Nel, in a statement issued in Pretoria.

The Minister said that in view of recent press reports on poliomyelitis, he had considered it advisable to put the matter before the public in its proper perspective and, at the same time, to urge that full advantage be taken of the facilities which the public fortunately had at its disposal in the Union for protective vaccination against the disease.

In recent years poliomyelitis had unfortunately been prevalent during the summer months. In some years this increased prevalence had in fact reached the magnitude of an epidemic, usually widespread throughout the Union. In the year ended 30 June 1957 there were 3,714 cases, the highest number ever recorded in one year, the great majority of which occurred during the summer months. During the summer which had just passed this high incidence had fortunately not been experienced. There were in fact only 607 cases reported between 1 July 1957 and now.

It was of course, impossible to predict with any degree of accuracy what was likely to happen next summer, or in any future year, but it was well known that the disease did tend to occur in

waves with intervening quieter periods. The public must therefore be prepared in case there was an increased incidence either next summer or at some future time.

While certain administrative measures could and were taken to prevent the spread of an epidemic once it had broken out, the only effective means for preventing such an outbreak and protecting the individual against the disease, was immunization against it by the use of poliomyelitis vaccine on as wide a scale as possible.

'Thus, while there is absolutely no reason for alarm we should guard against allowing ourselves to be lulled into a false sense of security by the fact that so little poliomyelitis occurred last summer,' the Minister said. 'We must therefore increase our efforts to ensure that as many people as possible are protected by inoculation'.

While it had not been claimed that immunization conferred complete protection against the disease there was ample evidence to show, both in the Union and in other countries that it did protect to a very large extent against paralytic poliomyelitis—and it was of course, this feature of the disease, the paralysis, that was so greatly feared. If the paralysis which so often occurred in the severe cases could be eliminated—as it was to a very great extent in those who had been inoculated—then the disease would surely lose its dread.

'My plea is, therefore, that the public should make full use of the vaccination facilities that are available. A course consists of 3 inoculations at intervals of 6-8 weeks, or longer, between the first and second and at least 7-8 months between the second and third inoculations. It accordingly takes some nine months to build up immunity against the disease and we should therefore not wait for poliomyelitis to become more prevalent before having our children and other young people inoculated but take time by the forelock and have it done at once.'

The Minister said the Polio Research Foundation must be given full credit for the splendid pioneering research work in the Union and for the large-scale production of vaccine which they had developed. The general public must also be thanked for their generous support which had made it possible for the Board of Trustees to provide the laboratory which had placed the Union in its present satisfactory position in this connection. Formerly, when the vaccine was first produced—and it was a long and complicated process—it was in short supply, and the Health Department therefore recommended that the available supplies should be used for certain priority groups—especially young children, who were the most susceptible to the disease.

Large batches of vaccine now came forward at regular intervals and, after the most careful consideration by the appropriate committee, were approved for release to the public. The vaccine was now in such good supply that it had been possible during the last year to extend the age groups to whom it was made available to include all children and young adults. It was particularly recommended that young women should be immunized before or soon after marriage as poliomyelitis, if it did occur during pregnancy, had in other parts of the world, sometimes been found to be fraught with certain dangers to the expectant mother.

In certain other countries where poliomyelitis vaccine had been used on a large scale over several years, and where a high proportion of the susceptible population had been inoculated, there had been a definite decline in the incidence of the disease and there was a significant difference between the incidence in immunized and non-immunized children, the disease being as much as four or five times as common in the latter.

'We in the Union should take full advantage of the fact that, as one of the few countries in the world which produces its own vaccine, we have plentiful supplies and we should ensure that all those who need to be protected against this disease are immunized', said the Minister.

THE BENEVOLENT FUND : DIE LIEFDADIGHEIDSFONDS

The following contributions to the Benevolent Fund from 1 December 1957 to 28 February 1958 are gratefully acknowledged:

Votive Cards in memory of:

Mrs. I. A. Vincent *by* Dr. and Mrs. M. Myers.
M. G. Jardim *by* Dr. M. Myers.
Sir Ernest Oppenheimer *by* Dr. and Mrs. J. Gluckman.
Dr. A. E. Dreosti *by* Dr. J. S. Boyd.
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Dr. G. J. Luyt *by* Dr. G. de Vos, Dr. A. W. S. Sichel, Dr. and Mrs. J. S. du Toit.
Dr. H. Maister *by* Dr. J. M. Edelstein, Hospital Board of Provincial Hospital, Port Elizabeth, Medical Advisory Committee of Provincial Hospital, Port Elizabeth, The Sisters Fund of Provincial Hospital, Port Elizabeth, Drs. R. Moore Dyke and J. T. Russell, Dr. M. G. Woolff
Dr. H. L. Heimann *by* Dr. A. L. Agranat, Dr. A. J. Orenstein, Dr. and Mrs. B. Weinbren, Drs. Heymann, Javett, Brand and Senior, Dr. J. M. Edelstein, Dr. L. Staz, Dr. J. Black, Dr. H. Goldwater.
Dr. J. Theunissen *by* Drs. Heymann, Javett, Brand and Senior.
Mr. C. v. d. Spuy *by* Dr. J. J. van Zyl.
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Total amount received from Votive Cards £121 4s. 6d.

Services rendered to:

Mrs. M. Cowan *by* Dr. W. H. Lawrence.
Dr. A. E. Pinniger *by* Dr. Ross J. H. McMahon.
Mrs. V. M. Victor *by* Drs. B. Goldberg, N. J. Meyer, I Glickman and Associates.
Mrs. J. M. Sachar *by* Dr. A. I. Goldberg.
National Employees Mutual *by* Dr. I. Kaplan.
Dr. C. E. Theron, *by* Drs. H. J. Besselaar, C. L. Laubscher, W. A. Lombard and P. Wessels.
Dr. W. Gilbert *by* Dr. J. L. van Selm.
Mrs. S. Pollen *by* Drs. C. Schulenburg, J. Rudolph, W. Owens and C. Geffen.
Dr. F. J. Kupper *by* K. V. O. Gunn.
'Anonymous' *by* Drs. T. Armstrong, M. L. Munday, G. Drummond, A. A. Cilliers and J. Coller and Mr. S. McMahon.
'A Grateful patient' *by* Dr. Patricia Massey.

Total amounts received for Services Rendered £63 1s. 0d.

Donations:

Drs. J. Waynik, R. Lane Forsyth, D. L. Ferguson, H. F. Snyman, B. M. Porter, G. C. Cruijwagen, J. J. van Niekerk, N. McG. Hall, A. P. Rose-Innis, A. T. F. Maske, R. Resnekov, F. R. Luke, A. R. Davidson, N. R. P. Nupen, S. A. Lange, Prof. E. C. Crichton, F. K. te W. Naude, W. H. du Plessis, M. A. F. Soffé, C. H. de la Harpe, M. G. Woolff, E. Cassim, N. K. Pein, F. L. Potter, E. C. Morley, J. Smithers, P. S. Bell, J. D. M. Barton, C. D. Scott, E. L. Galgut, R. B. Peckham, I. F. Taylor, S. S. Hoffmann, M. T. S. Conradie, J. P. Beazley, J. P. de Villiers, J. A. Currie, S. E. Rolfe, C. J. Kaplan, A. G. Sweetapple, A. Asherson, D. R. le Roux, G. C. Linder, C. F. Franzsen, E. E. Lazarus, H. E. Bernstein, H. P. G. Militz, A. G. Cheyne, P. V. MacGarry, N. C. Hopkins, C. C. Brown, H. S. Edwards, W. R. Hackmann, A. L. Wilson, W. Fabian, N. Shear, J. K. McKechnie, M. E. Schiele, J. O. Harle, N. A. A. van Buuren, C. E. Murray, P. N. Smith,

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Total £118 12s. 10d.

	£ s. d.
Proceeds Jones Phillipson Golf Competition	18 0 11
Margate V. A. D. No. 218	2 2 0
Members M.A.S.A. Benevolent Fund	11 4 3
Cape Western Branch Collection Box	7 12 10
Medical Wives Association of Port Elizabeth (share of 1957 subscriptions and proceeds of Dance) ..	186 17 6

Total amount received from Donations £344 10s. 4d.

Grand Total £528 15s. 10d.

PASSING EVENTS : IN DIE VERBYGAAN

Prof. E. B. Adams, Professor of Medicine at the University of Natal has been elected a Fellow of the Royal College of Physicians of London.

* * *

Dr. J. Adno of Johannesburg has changed his address to 502 Medical Arts Building, corner of Jeppe and Troye Streets, Johannesburg. The telephone numbers remain unchanged, namely, rooms, 23-8491, residence, 45-5436.

* * *

Lede word herinner dat hulle Sekretaris van die Mediese Vereniging van Suid-Afrika, Posbus 643, Kaapstad, sowel as die Registrateur van die Suid-Afrikaanse Mediese en Tandheelkundige Raad, Posbus 205, Pretoria, moet verwittig van enige adresverandering.

Versuim hiervan beteken dat die *Tydskrif* nie afgelewer kan word nie. Dit het betrekking op lede wat oorsee gaan sowel as dié wat binne die Unie van adres verander.

* * *

The following representatives of the South African Orthopaedic Association attended the joint meeting of the Orthopaedic Associations of the English speaking world at Washington during May: Prof. C. E. Lewer Allen and Mr. A. J. Helfet of Cape Town, Mr. George Dommisse of Pretoria, Mr. G. T. du Toit, Mr. Manuel Lunz and Mr. S. Sacks of Pretoria. On 14 May they were addressed in the Rose Garden of the White House by the President of the United States, who accorded them a hearty welcome and spoke appreciatively of the work done by the orthopaedic surgeons of the Allied Forces in World War II.

* * *

Dr. B. Kaminer, senior lecturer in Physiology at the University of the Witwatersrand, has been awarded a Rockefeller Foundation fellowship for further study and research into the fundamentals of muscular contraction. Dr. Kaminer, who is Dean of the Douglas Smit Residence at the University, will carry out his postgraduate study and research in the laboratory of Dr. Albert Szent-Gyorgyi, Institute for Muscle Research, Marine Biological Laboratory, Woods Hole, Massachusetts. Dr. Szent-Gyorgyi was awarded a Nobel Prize for his fundamental contributions to the field of metabolism and of the biochemistry of muscular contraction. Dr. Kaminer, who graduated at the University of the Witwatersrand in medicine in 1946, will take up his fellowship early in 1959.

* * *

The Health Officials' Association of Southern Africa will hold its Sixteenth Annual Health Congress in the Selborne Hall (next to the City Hall), Johannesburg, on 13-17 October 1958. This programme includes the following papers: *Mental Health—Some Public Health Aspects* by Dr. J. W. Scott-Millar, *Health Education in Relation to Food Handling* by Dr. H. Bloomberg, *Food Poisoning* by Dr. E. H. Cluver, *Hygiene in the Manufacture of Food* by Mr. A. H. Maxwell, *Practical Aspects of Plague Prevention* by Dr. M. L. Freedman, *Scientific Research and its Bearing on Public Health* by Dr. P. J. du Toit, *Growing Up* by Miss A. Macara, *Public Health Aspects of Virus Diseases* by Dr. P. A. D. Winter, *The Problems of Dental Caries and the Fluoridation of Water Supplies* by Prof. D. G. Steyn. The Congress fee is 3 guineas. Enquiries of Mr. L. R. Andrews, Honorary Congress Secretary, P.O. Box 4623, Johannesburg.

* * *

Position of Deputy Secretary General of the World Medical Association. The World Medical Association has established a position as Deputy Secretary General and invites nominations for the position, which must be received at the office of the World Medical Association, 10 Columbus Circle, New York 19 N.Y., U.S.A. on or before 15 November 1958. All applications must be transmitted by the Secretary of the national medical association of the candidate's country. The council indicates the following qualifications which are desirable, though it realizes that it may not be possible to find a suitable candidate possessing all these qualifications:

A. *Professional Requirements*

1. A fully qualified medical doctor preferably in the age group of 45 to 55 years; eligible for membership in his national medical association; and whose application is recommended by that association;

2. Who has demonstrated administrative and/or organizational experience;

3. A working knowledge of the 3 official languages of the World Medical Association, namely, English, French and Spanish;

4. Who is willing to take up residence in New York City as Deputy Secretary General at a starting salary of approximately 15,000 dollars annually, and is prepared to devote his full time to the interests of the Association with the reasonable expectation of being elevated to the position of Secretary General at a salary to be agreed upon when that office becomes vacant but who recognizes that such promotion will be based entirely upon merit and performance and be subject to the decision of Council.

B. *Age of Candidate*

Preferably in the age group 45-55 years.

C. *Retirement Age*

Retirement age shall normally be 65 years but may be postponed on an annual basis for a period not to exceed 5 years by mutual agreement between the Council and the incumbent.

Candidates are invited to submit (1) curriculum vitae, (2) salary requirements, (3) a recent photograph, and (4) the names and addresses of at least three (3) persons from whom references may be obtained.

REVIEWS OF BOOKS : BOEKRESENSIES

THE DENTAL ASSISTANT'S HANDBOOK

The Dental Assistant's Handbook. (Second Edition). By G. I. West. Pp. x+115. 71 Illustrations. 10s. 6d. London: Messrs. William Heinemann Medical Books Ltd. 1956.

Contents: Introduction. 1. General Reception and Secretarial Duties. 2. Surgery Duties. 3. Sterilization. 4. Psychological Approach to Patients. 5. Dental Hygiene. 6. Conservative Work. 7. The Anatomy of Teeth. 8. Dental Radiography. 9. Anaesthesia. 10. Dental Instruments and Equipment. 11. Common Dental Diseases and Abnormalities. 12. Prosthetics. 13. Dental Formulae. 14. Training and Employment. Index.

There is a very close relationship between the dental surgeon and his dental assistant that should be founded upon a sure foundation of respect and confidence, in order to survive the daily strain of a busy dental practice. Therefore it behoves the dentist to take special precautions in his search for the efficient one, and having searched and chosen one to educate and train her to his requirements. For this purpose G. I. West's booklet is available, and is useful both to trainer and trainee, for its concise yet comprehensive survey of the subject as well as its sympathetic understanding of the difficulties and requirements of the new girl. The activities of dental practice are reviewed under suitable chapters such as operative dental surgery, orthodontia, prosthetics, anaesthesia, radiography, psychology. The text is interspersed with liberal illustrations of dental instruments and equipment.

It is inevitable that each reader should think, as I have done, of some detail for inclusion in this book, but the very purpose of brevity would be lost by attempting to include all these trivia.

Nevertheless, I would appreciate an accentuation of the need in the trainee of clear and attractive diction, of a clear and legible handwriting, and a sense of humour. The lack of these three attributes can become very jarring with the repetition of the daily impact of nurse upon doctor in the stress of a busy practice.

Extra-mural activities, such as the payment and receipt of car licence and third party insurance premiums *before* they fall due, reminders of social engagements, etc., are helpful and evoke appreciation.

The ultimate chapter on training and employment is as useful to the dental surgeon as it might be to the prospective trainee, and is a fitting conclusion to an admirable little book.

F.A.N.

DENTAL HEALTH

Dental Health. Edited by H. H. Stones, M.D., M.D.S., F.D.S.R.C.S. Pp. 83+62 illustrations (51 in colour). 10s. 6d. post free. London: Dental Board of the United Kingdom. 1956.

Contents: 1. Anatomy and Physiology of the Teeth and Gums. 2. Diet and Dental Health. 3. Dental Diseases: Dental Caries, Gingivitis and Pyorrhoea, Malocclusion—Irregular teeth. 4. Control and Prevention of Dental Diseases: Control of Dental Caries, Prevention of Gingivitis and Pyorrhoea, Prevention of Malocclusion—Irregular teeth. Appendix. Typical Questions and Answers. Glossary. List of Dental Health Education Productions. Index.

This small book is sponsored and published by The Dental Board of the United Kingdom, to meet the requirements of school teachers in the quest of information on the anatomy and development of teeth, and common dental diseases. It is edited by Mr. H. H. Stones, Professor of Dental Surgery of the University of Liverpool, and many of its profuse illustrations in colour are by Mr. D. J. Kidd.

The subject matter is meticulously correct and comprises four chapters on Anatomy, Diet, Diseases and Prevention, with an appended list of useful posters, cinefilms, charts, etc., available from the Dental Board of the United Kingdom.

There is a glossary of terms employed, showing their derivation from the original French, Greek, Latin or other roots, that contrasts strangely in its pedantry, with the fanatical insistence of the Editor on a summary of each chapter, even of one chapter four pages in length.

The illustrations of normal and abnormal occlusion are unfortunate in their choice of colour. By suitable adjustments, these could remain informative without being repellant; the illustrations on tooth-brush drill, on the other hand, are attractive and refreshing; constituting a psychologically correct antidote to the potentially depressing subject of dental hygiene.

F.A.N.

SOUTH AFRICAN SNAKE VENOMS

South African Snake Venoms and Antivenoms. By P. A. Christensen, M.B. (Copenh.), Dip. Bact. Pp. 129. 43 Figures. Johannesburg: The South African Institute for Medical Research. 1955.

Contents: Introduction. Classification. Nature and Yield of Venom. Effect of Venom. Physical and Chemical Properties of Cobra Venom. Physical and Chemical Properties of Viper Venom. Electrophoresis of Venom. Absorption Spectra of Venoms. Influence of Drying on Venoms. Stability of Venom. Sterilization of Venom Solutions. Inactivation of Venom. Production of Anti-Snakebite Serum. Purification and Concentration of Antivenene. Estimation of Potency of Antivenene. The Cross Neutralizing Action of Antivenene. Incidence of Snakebite. Symptoms of Snakebite. Treatment of Snakebite. Alleged Antidotes and Other Therapeutic Agents. Snake Venom in Therapy. References. Author Index. Subject Index.

The total number of deaths from snake bite occurring every year in South Africa must be quite considerable but a true estimate of the incidence is impossible. Almost fifty of approximately 600 known species of venomous snakes in the world are found in this country. When it is realised in addition that the complex venoms secreted by clearly distinct species may be similar but not identical it is not surprising that the whole subject is fraught with difficulty and notwithstanding an abundant literature is still wide open for research.

Dr. Christensen has performed a useful service in presenting most of the available information on South African venoms and antivenoms, with much material based on his own research. The list of contents (above) indicates the general approach, but there is much detailed information with many tables and figures, particularly for the laboratory worker, on the effects of venom, their physical and chemical properties, and the estimation of the potency of antivenene. For the doctor in practice the final section on the incidence of snake bite (including seasonal aspects, age distribution, body site, geographical distribution), and the symptomatology and treatment are especially interesting. It is noteworthy that European children up to 10 years of age constitute a large number of those who are bitten. In general it is shown that the incidence of snake bite could probably be much reduced if shoes or boots, especially high boots, were worn. Viperine bites are more common than elapine (cobra, ringhals, mamba) bites; the ubiquitous puff adder, the largest and most venomous viper in Southern Africa heads the list. The incidence is highest in the coastal regions, especially in Natal.

The various measures adopted in the treatment of snake bite are carefully reviewed; the care required with a tourniquet to avoid aggravating the local action of viper venom, and certain other dangers, are emphasised.

This book will serve as a great aid to all persons interested in snake venoms and their antidotes.

N.S.

CORRESPONDENCE : BRIEWERUBRIEK

RODENT ULCER

To the Editor: In a recent article in the *Journal* (17 May 1958), Mr. T. Schrire gave an excellent account of rodent ulcers, their aetiology, pathology and possible means of prevention. But in his discussion on the management of the condition I fail to understand his logic. For this purpose he adopts a classification into 3 types. Briefly these types are:

1. Small lesions (less than 0·5 cm. diameter), which were equally well treated with surgery or radiotherapy except where damage might result from radiotherapy, e.g. to cartilage of the ear or the lens of the eye.

2. Larger lesions (more than 0·5 cm. diameter), which were treated with radiotherapy (aiming at 6,000 r over 14 days).

3. Complicated rodent ulcers, i.e. recurrents after radiotherapy, if bone is involved, or after cancer pastes have been applied. These were always treated by surgery.

As all tissues should be submitted for histology for confirmation of the diagnosis and to ascertain whether excision has circumscribed the lesion in all planes, surgery is the only method which can apply to Group 1. And if, after complications to rodent ulcers (Group 3), Mr. Schrire admits surgery is still adequate to eradicate the disease why then does this artificial Group **2** appear?

Is it out of loyalty to the radiotherapeutic member of the Combined Clinic rather than sound surgical sense? If the problem is one of reconstruction after removal of a lesion of larger dimensions then it should be performed by someone trained in such reconstructive methods. The excision should be planned and performed and the defect reconstructed by the same Surgeon. The patient is then discharged from hospital symptom-free, healed and free from his disease. Many procedures are quite easily carried out under local anaesthetic with minimal inconvenience to the patient. With radiotherapy 14 days is required and the area takes 6 weeks to heal, and not uncommonly much longer.

Does radiotherapy do any harm? We have seen many cases of radionecrosis which require major reconstructive surgery for their correction, whereas one feels that if surgery had been carried out in the first instance the procedures required would have been of a relatively minor nature. Even if local recurrence does occur after surgery any subsequent re-exploration is still a procedure of reasonable proportions.

We have also found in some of these cases of radionecrosis active basal-cell carcinoma to be present in the tissue removed in spite of the fact that radiotherapy was given in such doses as to damage normal tissue. I must stress that reconstructive work on irradiated tissue usually involves bringing in full-thickness flaps, as free grafts on such tissues are often doomed to failure. At the Brenthurst Clinic, Johannesburg, more *extensive* reconstructive procedures are done for the effects of radiation of rodent ulcers than for cases in which there has been no radiation at all.

S. J. Hersch

Clarendon Centre
East Avenue, Clarendon Circle
Johannesburg

24 May 1958

1. Schrire, T. (1958): S. Afr. Med. J., 32, 520.

RADIATION HAZARDS

To the Editor: Dr. B. W. Franklin Bishop,[1] in your issue of 26 April 1958, states that he wishes to draw the attention of the profession to apparently conflicting statements made by Prof. S. F. Oosthuizen on the subject of radiation hazards. Dr. Bishop would, therefore, appear to be inviting the comments of the members of the profession on the subject of Professor Oosthuizen's alleged contradictions and also on his own views.

In the first place, Dr. Bishop quotes extracts from the *Rand Daily Mail* of September 1956 and the *Natal Mercury* of 31 March 1958. A paragraph taken from an article or a report of an address in the lay press may quite easily be out of context.

In the quotation from the *Rand Daily Mail*, Professor Oosthuizen was stressing the dangers of excessive radiation which may result from unnecessarily prolonged X-ray investigation; for instance, when 12 films are taken when 2 would be enough. A single paragraph is quoted from the report of an address in the *Natal Mercury*, in which Professor Oosthuizen is reported to have stated that the radiation danger has been magnified out of all proportions. with the result that there was a danger of not obtaining sufficient trainee radiographers for the radiological services. There is nothing inconsistent in Professor Oosthuizen's two statements. In the first case he was stressing the dangers of radiation; 18 months later he was indicating that it is possible to over-stress the dangers and thus cause various difficulties.

Professor Sievert of Stockholm, one of the most eminent radiation physicists in the world, who has taken a leading role formulating rules and regulations for protection against radiation, and was instrumental in having X-ray machines licensed in Sweden, spoke in almost the identical terms used by Professor Oosthuizen at a Conference on Biological Hazards of Atomic Energy.[2] He, too, pointed out the danger of not getting sufficient radiographers if the dangers were unreasonably over-stressed.

Both Professor Oosthuizen and Professor Sievert are supported by recent publications on this subject by eminent radiologists. Dr. Paul C. Hodges[3] in discussing the subject states: 'With the possible exception of those examinations in which the ovary or the testis inevitably lies in the direct beam, diagnostic radiology even as it is practised today by qualified radiologists is not contributing 30-year gonadal doses that are significant relative to background.'

It has generally been accepted that the life expectancy of physicians who use X-rays is shorter than those who do not. Drs. Raymond Seltser and Phillip E. Sartwell[4] challenge this view, stating: 'The fact that the average age of radiologists at death is younger than that of other physicians cannot be ascribed to their exposure to ionizing radiation, since differences in age composition alone can account for the findings.'

Dr. George Tievsky[5] writes: 'Common sense demands that the practitioner view the current lay and scientific alarm about the harmful effects of ionizing radiation with a sense of proportion. There is no reason for the practitioner to feel uneasy about radiation when it is being used with conservative judgment and skill.'

No one will deny that patients should not be submitted to unnecessary radiation. At the same time, there is no doubt that the dangers have been over-stressed by ill-informed lay and medical people. Dr. Bishop says, 'One is certainly seeing cases of over-irradiation and one feels that the problem is becoming more serious all the time and will continue to do so.' The cases of over-irridiation which Dr. Bishop says he sees are not related to and have no bearing on the subject of the over-irradiation which Professor Oosthuizen discussed. Dr. Bishop as a plastic surgeon may see cases of rodent ulcer or skin epithelioma which have been over-irradiated during therapy. This has nothing to do with diagnostic over-irradiation.

The vast majority of rodent ulcers (over 90%) occur in the face, neck and scalp, that is, the regions furthest away from the gonads. These rodent ulcers and epitheliomata are treated by radiologists with low-voltage radiation either with contact apparatus or near-distance apparatus. Rodent ulcers, again in the vast majority of cases, are only about 1 cm. in diameter. Low-voltage contact or near-distance radiation to a lesion of this type cannot possibly cause blood changes, cannot possibly give rise to lymphatic leukaemia, and cannot cause genetic effects. When a medical man confuses these two types of radiation procedures, that is, the radiation from diagnostic radiology applied to large parts of the body and the quite different effects from over-irridiating a small area of skin 1 cm. in diameter, which at worst can only give rise to some local necrosis, is there not justification for professor Oosthuizen and Professor Sievert pointing out the risk of over-stressing the dangers?

M. Weinbren

3-5 Dunkeld Chambers
Smal Street, Johannesburg

21 May 1958

1. Bishop, B. W. F. (1958): S. Afr. Med. J., 32, 460.
2. Haddow, A. ed. (1952): *Biological Hazards of Atomic Energy*. London: Oxford University Press.
3. Hodges, P. C. (1958): J. Amer. Med. Assoc., **166**, 577 (8 Feb.).
4. Seltser, R. and Sartwell, P. E. (1958): *Ibid.*, **166**, 585.
5. Tievsky, G. (1958): *Ibid.*, **166** (5 April).

ANTIBIOTIC FOR MALTA FEVER

To the Editor: Your leading article on recent developments in the treatment of Malta fever (*Journal*, 24 May) was interesting but one was surprised that the trade name of the antibiotic was given and its accepted name not even mentioned. This might cause confusion as it is at times difficult to remember which are really new antibiotics and which are older ones parading under a different name.

In a review of Novobiocin, Finland and Nicholls state (*Practitioner*, 1957, **179**, 84) 'by common agreement the antibiotic was later given the generic name novobiocin whereas the trade names 'cathomycin', 'albamycin' and 'cardelmycin' were given to the products of their respective producers'. These products were shown to have the same chemical structure and to be identical in action. Again in a special article on Antibiotics (New Engl. J. Med., 1958, **258**, 85) novobiocin is listed; cathomycin is not even stated as an alternative name.

S. Schur

'Westgate', Main Road
Plumstead, Cape

25 May 1958

[Our correspondent is right in stressing the identity of cathomycin with novobiocin. Novobiocin is produced by the actinomycete *Streptomyces niveus*, and albamycin and streptonivicin are trade names for it. Cathomycin (cathocin) is produced by *Streptomyces spheroides* and is identical with novobiocin. Cardelmycin is also identical. (Martin, W. J. *et al.*, 1956, *Proc. Mayo Clinic*, **31**, 416.)—*Editor.*]